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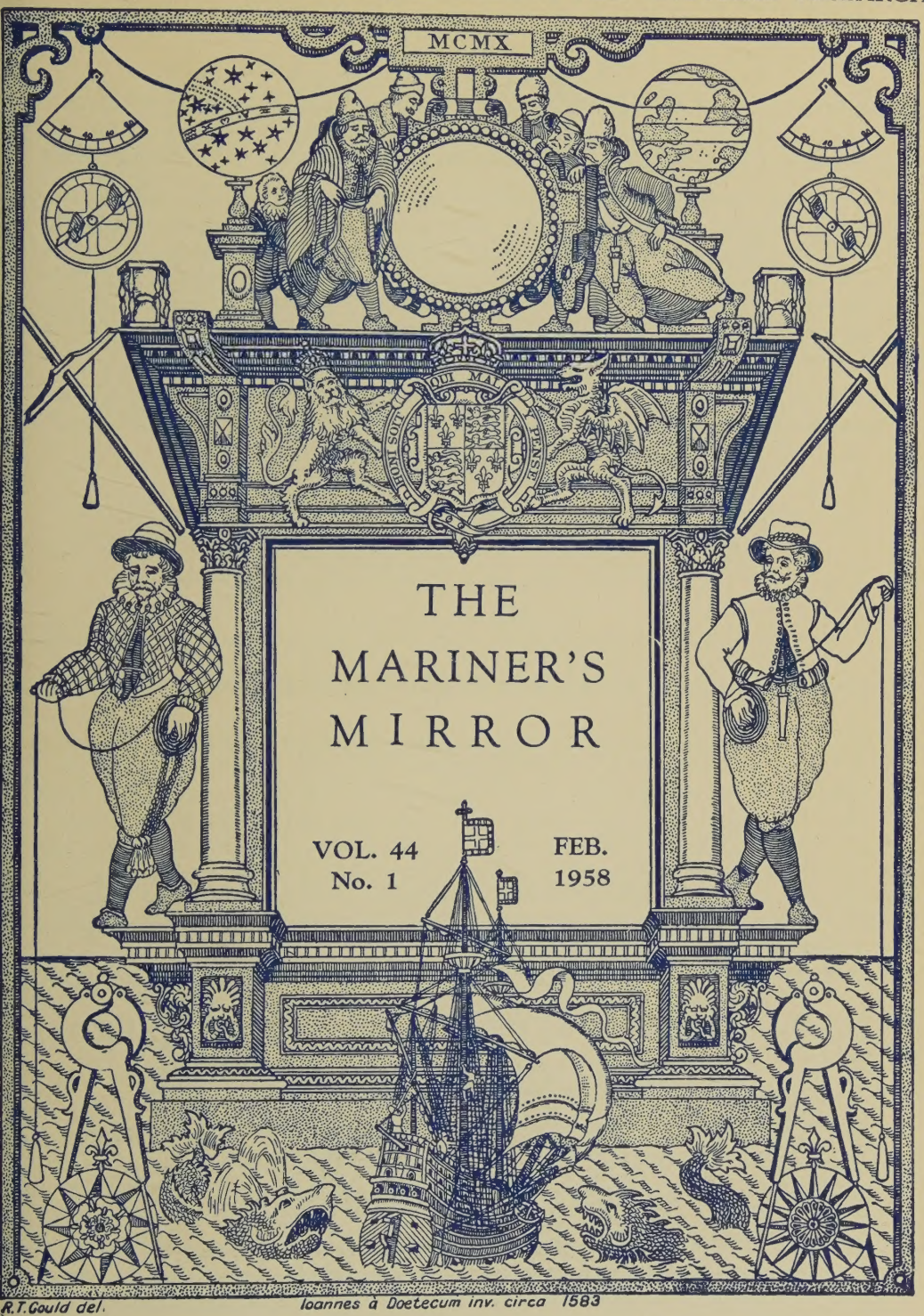

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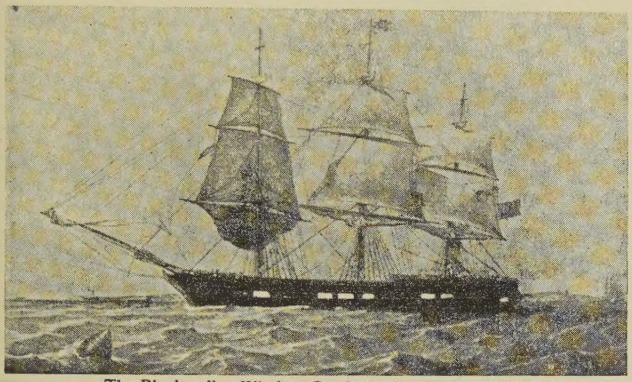

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OBITUARY

ADMIRAL SIR AUBREY SMITH

Admiral Sir Aubrey Clare Hugh Smith, K.C.V.O., K.B.E., C.B., died on Sunday, 6 October 1957, at the age of 85. He came of the well-known merchant-banking family of the City of London—his father was Governor of the Bank of England in 1897–8—and went to sea at the age of 13. Promoted to commander in 1903, he commanded successively two small ships, the *Iris*, boys' training ship, and the 3rd-class cruiser *Foresight*. After two years at the Admiralty he received the first of his long series of diplomatic appointments as Naval Attaché at St Petersburg, Stockholm and Oslo; that he held for just over three years in the course of which he was promoted captain. When the fleet was mobilized in 1914, he became flag captain of the *Drake*, flagship of the 6th Cruiser Squadron, Rear-Admiral W. L. Grant. In March 1915 he was sent to the Admiralty as Assistant D.N.I. under Captain Reginald Hall. After 18 months in that post he was appointed Commodore in the Eastern Pacific, with his broad pendant in the famous *Glasgow* where he served until after the end of the war. In 1921 he was promoted Rear-Admiral and became Head of the British Naval Mission to Greece, a task for which his earlier service in a diplomatic post made him especially fitted. It was brought to an end, however, after two years by a revolution in Greece and he was appointed Naval Representative on the Advisory Committee of the League of Nations. In 1926 he was promoted Vice-Admiral and, not having flown his flag at sea, was placed on the retired list; he continued to hold his League of Nations appointment, however, until 1927, when his naval service came to an end. It was rewarded the following year by the award of a K.B.E., and he was promoted Admiral in 1930.

Aubrey Smith was then but 55, and full of energy. His family connexion with the City of London opened the way for a fresh career in that milieu, into which he threw himself with enthusiasm. He became a director of Hay's Wharf, an important and old-established London business which was largely controlled by his family, and took a very active part in its conduct for many years. As a member of the Fishmongers' Company—of which in his turn he was elected Prime Warden—he was equally active in its charitable and other work. Not unnaturally, he was drawn into many other City activities for which his clear brain and great abilities especially fitted him. He retained his great interest in the sea and the Navy, and was till his death an active member, Councillor and Vice-President of the Navy Records Society and the Society for Nautical Research. In 1947 he was created K.C.V.O. In 1899 he married the Hon. Elizabeth Grosvenor, daughter of Lord Stalbridge; she died in 1931.

H. G. T.

M. A. DE RUYTER, 1607–1676

By C. R. Boxer

MICHIEL ADRIANSZOON DE RUYTER is the national hero of the Netherlands. His life and deeds are as familiar to our neighbours on the other side of the North Sea as those of Nelson are to us, or those of Washington to Americans. Probably no other Netherlander, save William the Silent, has so much been written about, both by his countrymen and by foreigners, and he is universally recognized as one of the greatest admirals of all time. This being so, it is at first sight rather surprising that there is no full-length technical study of his strategy and tactics, particularly since the 'De Ruyter archief' at The Hague contains a great deal of relevant material. But although this includes thirty-seven autograph ships' journals (fourteen of them relating to his years as a merchant skipper and whaler), these are written in a very laconic and uninformative style from the tactical point of view. His contemporary biographer states that the pious old admiral took care to destroy many relevant documents, being desirous that the credit for his victories should be given to God alone.[1] Even so, there is obviously no lack of documentation for the principal battles in which he was engaged, although only a seaman with experience in sail and a real historical sense can probably make adequate use of it. The late Captain J. C. M. Warnsinck of the Royal Netherlands Navy possessed just these qualifications and planned just such a work. Unfortunately, his premature death in 1943 prevented him from fulfilling what he had so brilliantly begun with the publication of his masterly study, *Admiral de Ruyter. De Zeeslag op Schooneveld, Juni 1673* (The Hague, 1930).[2] A landsman like myself is obviously unfit to tackle this aspect of the great admiral; the present article is therefore limited to a biographical sketch with the emphasis on how De Ruyter's English contemporaries regarded him.

Michiel Adrianszoon was born on 24 March 1607 in a working-class family of Flushing, his father having been successively a sailor and a brewer's drayman. Both of his grandfathers had been soldiers in their time,

1 G. Brandt, *Leven en bedryf van den Heere Michiel de Ruiter* (Amsterdam, 1687), p. 986.

2 This was to have been followed by monographs on the Four Days Fight and St James's Fight (1666), on which he was actively engaged at the time of his death. The outstanding English contributions in this field are all by R. C. Anderson, *Journals and Narratives of the Third Dutch War* (Navy Records Society, Vol. LXXXVI, 1946); *Naval Miscellany*, Vol. IV (N.R.S., 1928), pp. 3–47; *Journal of the first Earl of Sandwich 1659–1665* (N.R.S., 1929), XLVII–LXXI; *Journals of Sir Thomas Allin 1660–1678*, Vol. II (N.R.S., 1940), pp. XVI–XXXV.

and it was from his maternal grandfather that in 1632 or 1633 he took the name of Ruyter or 'Trooper'. The fashionable 'de' was added by contemporaries many years later, but he does not seem to have used it himself when signing his name. Tradition alleges that he was an adventurous and unruly boy, climbing the tallest steeple in the town on one occasion; and it is certain that his heart was early set on going to sea, which he did for the first time (as a boatswain's boy) in August 1618. Among his first employers were the Lampsen brothers, two of the leading merchant-oligarchs of Flushing and directors in both the East and West India Companies. It was evidently in their service that he made his first voyages to the West Indies; and it is also alleged that he served as a factor for the Lampsen brothers (or one of them) at Dublin for as long as seven years. As doubt has been cast on the authenticity of this statement, it is worth while reproducing the original passage on pp. 13–14 of the very rare, anonymous *Life of Michael de Ruyter Admiral of Holland* published at London in 1677.

In this office [keeping the Lampsen family accounts] he carried himself with so great fidelity and discretion, and thereby gained so great esteem from his master, that he advanced him to be his book-keeper, and to the management of his merchant-affairs; wherein being likewise much satisfied with his skill and diligence, he pitched upon him as a person every way qualified for a Factor in his trade in Ireland, which consisted in butter, herrings, tallow and hides, and accordingly sent him to Dublin. There he lived seven years under the inspection of Mr Cremor, Mr Vanhorn, Mr Wiborn, and some others of his master's correspondents;[1] during which space, besides his attaining of the English Tongue (very necessary to him who was afterward to treat so often with the English in their own language) he gave so great proofs of his dexterity in the conduct of affairs of trading, and of his faithfulness to his trust, and thereby so much content to his master and correspondents, that by them he was sent into the Straits, to negotiate as Supercargo of their concerns there.

Unfortunately, no dates are given for this Irish interlude, and no other authority explicitly supports such a lengthy stay, although his other contemporary biographers, Van den Bos, Piélat and Gerard Brandt, all relate that he made trading voyages to Ireland at some unspecified times.[2] Van den Bos, indeed, states that he was at Dublin when the Irish attempted to seize the city by a *coup de main*.[3] This presumably refers to the episode of 22 October

1 There was a flourishing Dutch commercial community at Dublin in the first three decades of the seventeenth century, and 'Mr Wiborn' may be identical with one of the two Dutch merchants named Wybrants mentioned in J. P. Gilbert, *Calendar of ancient records of Dublin*, Vol. III (Dublin, 1892), pp. 550–76 *passim*.

2 G. Brandt, *Leven* (1687), p. 16; L. Van den Bos, *Leven en daden der doorluchtighste zeehelden* (Amsterdam, 1676), p. 278; Barthélémy Piélat, *La Vie et les actions memorables du Sieur Michel de Ruyter* (2 vols., Rouen, 1678), Vol. I, p. 4. It should be noted that although Piélat copied closely from Van den Bos, the English *Life* of 1677 is much fuller on this point and quite independent of either. The standard modern biography is by P. J. Blok, *Michiel Adrianszoon de Ruyter* (The Hague, 1928), of which there is a drastically abridged English translation by G. J. Renier (1933).

3 Van den Bos, *Leven en daden* (1676), p. 278.

[O.S.] 1641; but this date is manifestly wrong, as De Ruyter only returned from his second Brazil voyage on 1 May and was appointed *schout-bij-nacht* (rear-admiral) of the fleet sent to help Portugal on 20 June 1641. However, it has been generally overlooked that Brandt states explicitly that De Ruyter was not only relatively fluent in English but also in Irish.[1] This last was a most unusual linguistic accomplishment. It is much more likely to have been acquired as a result of some years' residence in Ireland than on board ship or on fleeting visits. Although 'seven years' may well be a mistake or an exaggeration, it is nevertheless probable that De Ruyter did indeed live long enough at Dublin in his youth (about which very little is known)[2] to learn both English and Irish.

Whatever the truth of this supposition, De Ruyter's knowledge of foreign languages was merely a by-product of the outstanding skill in seamanship and practical navigation which he acquired in the course of some thirty years of voyaging and fighting after he first went to sea. During this time, he worked his way up from cabin-boy to captain and shipowner, with a fund of practical experience of every job on board a ship which few other great admirals have ever possessed and which none have ever surpassed. He made numerous whaling voyages to the Arctic seas and trading voyages to Brazil, the West Indies, Morocco, North Africa and the Mediterranean, to say nothing of other voyages nearer home to places like Spain, France and the British Isles. During these years he not only learned the hard way as a sailor and a trader from the Levant to the Caribbean, and from Spitzbergen to Pernambuco, but he was frequently in action against such various and doughty opponents as Basque and Dunkirk privateers, Barbary rovers, and the hereditary Spanish enemy. On one of his earliest voyages he was wounded and captured in a fight with a Basque privateer in the Bay of Biscay; but he effected his escape soon after, being landed in Northern Spain, and with two comrades begged his way home through France. This was, incidentally, the only occasion on which he was wounded in action until the mortal hurts which he received off Sicily in 1676; but in September 1666 he was temporarily incapacitated by an accident on board his flagship when a gun went off prematurely and a piece of lighted fuse flew into his mouth.

As indicated above, De Ruyter's first official command at sea was as rear-admiral or *schout-bij-nacht* of the Dutch fleet under Arnout Gysels which

1 'Hy verstond verscheide taalen, die hy niet in de schoolen, maar ter koopvaardy varende, door lange verkeering in vreemde gewesten, hadt geleerdt, en eenighzins sprak, als Spaansch Portugeesch, Fransch, en inzonderheit Engelsch en Yrsch' (G. Brandt, *Leven en bedryf*, p. 989).

2 The only definite date that can be attached to De Ruyter's movements between 1618 and 1631 is that he served as a gunner in the Bergen-op-Zoom campaign of 1622.

was sent to help the Portuguese who had broken free from Spain in December 1640. Unfortunately, we have no information why De Ruyter, then a merchant-skipper, was selected for this command at a time when a number of equally experienced naval officers were available; but his selection does indicate that he was already highly regarded as a seaman, since there is no reason to suppose that he had any influence with the government at this period. He took a leading part in the sharp but indecisive action with a Spanish fleet off Cape St Vincent in November 1641, and indeed his conduct was the chief reason why the battle ended in a draw instead of a victory for the Spaniards. After his return home in January of the following year, he left the naval service and resumed his activities as a merchant-skipper in the Mediterranean, Morocco and the West Indies, sometimes sailing on his own account and sometimes on that of the Lampsen brothers. It was in the course of these voyages that he became familiar with the English at Barbados and elsewhere in the West Indies, as their Caribbean colonies depended to a great extent on Dutch shipping to furnish them with slaves and supplies in exchange for sugar and tobacco.

By 1652 De Ruyter had acquired a modest fortune, and two previous wives having predeceased him he married his third and last, Anna van Gelder, in January of that year. For all his experience and love of the sea, De Ruyter was not enamoured of a sea-faring life to the exclusion of everything else. In fact he had come to prefer the family life of a solid Dutch burgher in his home town. He was a man of deep if unostentatious piety, whose favourite occupation in the long winter evenings seems to have been reading the Bible aloud in his home circle, or singing psalms in what his modern biographer calls 'his loud but not untuneful seaman's voice'.[1] But he was no kill-joy, and he certainly liked a convivial glass of wine with his friends, while abhorring that boorish drunkenness which was such a marked feature of Dutch and English maritime life in the seventeenth century. He was now middle-aged and his youthful passion for the sea had evidently been sated. He no longer felt the emotions expressed by the old seaman's ballad:

Ik ben zeeman in mijn hart,
Ik walg van landvermaken;
Zelfs in d'armen van mijn vrouw,
Hoor ik de masten kraken.[2]

1 G. Brandt, *Leven en bedryf* (1687), p. 987; Blok, *M. A. de Ruyter*, p. 306. I have the impression that Brandt, being a *predikant*, may have exaggerated De Ruyter's undoubtedly genuine piety.

2 'I am a seaman in my heart, I detest all joys ashore, even in the arms of my wife I hear the masts creak.'

He therefore settled down to a well-earned retirement with his new wife, but he was not destined to enjoy this for more than a few weeks. War between the Commonwealth of England and the United Provinces of the Free Netherlands broke out in May 1652, and De Ruyter was very soon offered a command in the States's navy. He was at first exceedingly reluctant to serve at all, and only consented after considerable pressure was brought to bear on him. But he achieved international fame in this war, and the English soon realized that this burly, ruddy-faced, blue-eyed and pious man was one of their toughest and most formidable opponents.

Convoying a fleet of sixty merchant ships down the Channel in August 1652, De Ruyter repelled an attack by a superior force under Sir George Ayscue, whom he forced to retire on Plymouth. On his return voyage with another convoy he completely outmanœuvred the superior English squadrons waiting for him in the Channel, although Vice-admiral Penn consoled himself for being deprived of his expected prey by describing De Ruyter's evasive tactics as 'poor and low spirited'.[1] De Ruyter shared in the Dutch defeat off the Kentish Knock (8 October 1652) and in Tromp's victory off Dungeness (10 December 1652), and he was one of the heroes of the three-day fight from Portland Bill to Calais Cliffs (28 February–2 March 1653). On the first day of this last action he boarded and captured the *Prosperous* (44), which had to be later abandoned when the Dutch were forced to retreat up the Channel. He likewise took a leading and honourable part in the last three great battles of this war in the North Sea, losing half his ship's company and having his flagship completely dismasted in the final battle off the Texel (10 August 1653), when the commander-in-chief, Lieut.-Admiral M. H. Tromp, was killed.[2]

So outstanding was De Ruyter's conduct and courage in this war that the Grand Pensionary of Holland, Johan de Witt, who was the real leader of the country, offered him the post vacated by Tromp's death. De Ruyter unhesitatingly declined the proposal, mainly out of modesty, but also because he was reluctant to be promoted over the heads of so many senior naval officers, including the elder Eversten and Witte de With. However, he was persuaded to leave his native admiralty and province of Zeeland to become Vice-Admiral of Holland in the service of the Amsterdam Admiralty Board. The mutual esteem and friendship which prevailed henceforth between De Ruyter and De Witt was one of the major factors in the overhaul and improvement of the Dutch Navy and was to have excellent results in

1 Granville Penn, *Memorials of Sir William Penn, Knt.* (2 vols., 1833), Vol. I, p. 444; D. Hannay, *Short History of the Royal Navy* (2nd ed.), Vol. I, pp. 240–2.

2 *M.M.*, Vol. XL (February 1954), pp. 33–53, for a biographical sketch of M. H. Tromp, 1598–1653.

the next two wars with England.[1] It may be added that although De Ruyter now became a citizen of Amsterdam he never forgot his Zeeland birth and upbringing; both he and his wife retained their provincial accent until their dying day.

During the next five years De Ruyter served against French and Barbary corsairs in the Mediterranean, relieved the blockade of Danzig by the Swedes, and captured part of a Portuguese sugar-fleet from Brazil off the mouth of the Tagus in 1657. In the years 1659–60, most of his time was spent in the Baltic, where a Dutch fleet was supporting the Danes and an English fleet was exercising benevolent neutrality towards the Swedes. His capture of Funen and Wyborg in November 1659 was celebrated by the poet Vondel and brought him more practical rewards from the grateful king of Denmark. He was employed again in the Mediterranean and the Straits in 1661–4, where English and Dutch watched each other once more with jealous eyes, since England was the ally of Portugal by virtue of Charles II's marriage with Catherine of Braganza, and the States-General were now very favourably inclined (for commercial reasons) towards their former enemy, Spain. In the summer of 1661 the English were very nervous lest De Ruyter, with Spanish aid, might forestall their occupation of Tangier and intercept the homeward-bound Brazil Fleet, in which English merchants were deeply interested. But De Ruyter's orders limited him to securing the safety of the Spanish Plate Fleet and this particular scare soon passed, though others subsequently arose to take its place.

The correspondence of the English diplomats in Spain and Portugal during these years shows clearly how highly the English already regarded De Ruyter, and with what watchful suspicion they followed his movements. The growing tension between the two countries reached the breaking-point in the late autumn of 1664, when news came that an English squadron under Sir Robert Holmes had seized some of the Dutch West India Company's trading settlements on the West African coast, while another, under Major Richard Nicolls, had occupied New Amsterdam on Manhattan Island, now renamed New York. Another struggle for the mastery of the seas was clearly in the offing,[2] and it was the whereabouts and activities of De Ruyter which caused the English most anxiety. Although they kept a close eye on his movements in the Mediterranean, he contrived to give them the slip on the receipt (1 September 1664) of secret orders

1 J. K. Oudendijk, *Johan de Witt en de zeemacht* (Amsterdam, 1944), *passim*. For the series of rather Box and Cox promotions in the Dutch Navy see R. C. Anderson, 'Dutch Flag Officers in 1665–7 and 1672–3', *M.M.*, Vol. XXIV (1938), pp. 40–8.

2 C. Wilson, *Profit and Power. A study of England and the Dutch Wars* (1957), pp. 90–126, for a recent reassessment of the causes of this war.

rom Holland to take reprisals for Holmes's actions in Guinea. In this he vas completely successful, Samuel Pepys recording despondently in his *Diary* on the 22 December 1664: 'Thence to the 'Change; and there, among the merchants, I hear fully the news of our being beaten at Guinea, by De Ruyter, with his fleet...it being most wholly to the utter ruin of our Royal [African] Company, and reproach and shame to the whole nation, as well as justification to them in their doing wrong to no man as to his private [property], only taking whatsoever is found to belong to the Company and nothing else.' The diarist was still more upset two months later, when alleged eye-witness reports were circulated that: 'De Ruyter with his fleet in Guinea hath proceeded to the taking of whatever we have, forts, goods, ships, and men, and tied our men back to back, and thrown them all into the sea, even women and children also.' Pepys had sufficient sense to express surprise that De Ruyter who 'was so kind to our men at first' should have acted in this barbarous fashion, and he feared that he had not done so without grave provocation. Two days later this story was exploded when the self-styled eye-witness of these atrocities publicly recanted, 'confessing it a lie, and that he did it in hopes to get something'. Later news brought confirmation of the exemplary way in which De Ruyter had treated his English prisoners.[1]

Having restored the Dutch position in Guinea, De Ruyter sailed across the Atlantic to attack Barbados, but here he was unsuccessful, as the island had received timely warning and ships and forts were ready to give him a hot reception. Nevertheless, he led his squadron boldly into the harbour on the 20/30 April 1665 and a fierce battle ensued. The master of the ketch *Hopewell* in his report of the action wrote: 'De Ruyter was not so far from me as twice the length of his ship. I did see him on the poop, with a cane in one hand, and a cuttle-axe in the other, and as he stayed I did see most part of his quarter carried away.... I did see De Ruyter's stern to be carried in, it was so wide as a barn door; and after that shot, they did not fire any more, for I do suppose De Ruyter was then killed.'[2] De Ruyter was not killed, but his squadron was so mauled that he was forced to break off the action and sail to Martinique to refit.

Great was the jubilation in England when news of 'the Barbados Bravery' reached London,[3] but it was soon lessened when further news came that De Ruyter had captured several ships at St Christophers and elsewhere, and

1 *Diary of Samuel Pepys* (ed. Wheatley), Vol. IV, pp. 312–13, 315, 360–1. Cf. also Pepys to the Earl of Sandwich, 12 January 1665, in *Further Correspondence of Samuel Pepys* (ed. J. R. Tanner), Vol. I, p. 34.

2 V. T. Harlow [ed.], *Colonizing expeditions to the West Indies and Guiana 1623–1667* (1925), pp. 109–10.

3 *The Routing of De Ruyter or the Barbadoes Bravery*, a broadside published at London in 1665.

spoiled the Newfoundland fishery, before heading for home with his squadron, seven prizes and a rich booty. It may be added that as usual he treated the English prisoners very humanely, releasing most of them with adequate provision of food and water. The English hoped to intercept him in the North Sea on his return voyage round Scotland, but once again he gave them the slip by a combination of good luck and good seamanship. A providential mist off the north-east of Heligoland hid him from Sandwich's ships cruising there on 5 August, and next day he entered the difficult harbour of Delfzijl without the aid of pilots, buoys, or sea-marks. The undisguised chagrin of the English at missing him is reflected in Pepys's diary and in Downing's despatches from The Hague. 'How came De Ruyter to destroy so many ships at the Leeward islands in the West Indies? Had not they warning as well as Barbados?', wrote the latter irritably in his despatch of 11 August reporting De Ruyter's triumphant return, which, he said, 'makes them very huff here'.[1] It did, indeed, for morale was at a low ebb after Wassenaer van Obdam's defeat and death at Lowestoft in June, and De Ruyter (who had been promoted Lieutenant-admiral of Amsterdam in his absence) was universally felt to be by far the best choice for the post of commander-in-chief. The confidence felt in De Ruyter was evidently extended to his family, for the Guinea and Barbary gold which the admiral brought back from his voyage was provisionally entrusted to the care of his wife by a decision of the Admiralty Board.

Promoted to the rank of Lieutenant-admiral of Holland and West-Friesland with the post of commander-in-chief a few days after his return, stormy weather alone prevented a major clash with the English fleet off the Dogger Bank in September 1665. The battle so eagerly sought by both sides was joined in the famous Four-Days Fight of the *Annus mirabilis*, 1666 (11–14 June). Bonfires were lit on both sides of the North Sea to celebrate a victory, but in truth the Dutch 'had all the marks of victory on their side', including fewer casualties, fewer ships lost, and the bodies of one live English admiral and one dead one. The fight was acknowledged to be the fiercest fought on the ocean until then, and it was undoubtedly one of the most exhausting. De Ruyter's inspiring leadership was generally acknowledged to be (the disgruntled Cornelis Tromp alone dissenting) the principal reason for the Dutch success, but the admiral himself showed no undue elation. When a French volunteer, the Comte de Guiche, came aboard the flagship to congratulate De Ruyter on the hard-won victory on the evening of the fourth day, he found him sweeping out his cabin with a broom and feeding his chickens.

1 H. T. Colenbrander (ed.), *Bescheiden uit vreemde archieven omtrent de groote Nederlandsch zeeoorlogen* (2 vols., The Hague, 1919), Vol. 1, pp. 280–2.

The next battle, 'St James' Fight' (25/26 July O.S.), went against the Dutch, but even so, De Ruyter acquired almost as much personal honour as in the former victory, for he covered the retreat of his shattered fleet in a fashion which aroused the admiration of his enemies. Pepys, as usual, can be relied upon to provide the picturesque touch, in the form of an anecdote related by his colleague, Sir William Coventry, of the duel between De Ruyter's *Zeven Provincien* (80), and the heavier-gunned *Royal Charles* (86), on which were the English commanders, Prince Rupert and the Duke of Albemarle. Coventry 'spoke slightingly of the Duke of Albemarle, saying when De Ruyter come to give him a broadside,—"Now", says he, chewing of tobacco the while, "will this fellow come and give me two broadsides, and then he will run"; but it seems he held him to it two hours, till the Duke himself was forced to retreat to refit, and was towed off, and De Ruyter stayed for him till he come again to fight. One in the ship saying to the Duke, "Sir, methinks De Ruyter hath given us more than two broadsides"; "Well", says the Duke, "but you shall find him run by and by", and so he did, says Sir W. Coventry; but after the Duke himself had been first made to fall off again.' Next day, incidentally, Pepys was 'mightily joyed' at the news of the death of De Ruyter; 'but when Sir W. Coventry come, he told us there was no such thing, which quite dashed me again, though, God forgive me! I was a little sorry in my heart before lest it might give occasion of too much glory to the Duke of Albemarle'.[1]

The English followed up their victory by 'Holmes' bonfire', when Sir Robert Holmes burnt 150 sail of merchant-ships lying in the Vlie and plundered a village on Terschelling. This blow was more than avenged next year when De Ruyter sailed up the Medway and burnt six of our finest warships at Chatham, landed a detachment of marines at Sheerness, and carried off to Holland as prizes the English flagship *Royal Charles* and two other vessels. This must rank as the most humiliating reverse ever inflicted on British arms before the Japanese capture of Singapore in 1942; but both in conception and execution it was chiefly due to the brothers Johan and Cornelis de Witt (the latter being on board the fleet) who kept pressing De Ruyter and his subordinates to sail further up the river at a time when all the naval officers were very hesitant about doing so.[2] We may add that De Ruyter strictly forbade his landing-parties to plunder private property and civilians, despite the provocation which the English had given on Terschelling in the previous year.

De Ruyter had now a European reputation, and V.I.P.'s from many lands who visited Amsterdam in the four and a half years of peace which

1 *Diary* (ed. Wheatley), Vol. v, pp. 382–3.
2 P. J. Blok, *M. A. de Ruyter*, pp. 275–85.

followed the conclusion of the Treaty of Breda, made a point of calling on the admiral in his home. They never failed to be struck by his unaffected modesty and friendliness, as can be seen from the account of three young Englishmen who met him on the eve of the third Dutch war. 'Thence we went to see Admiral de Ruyter who lives there upon the quay in a pretty house.[1] He received us courteously and made us taste a glass of Navarre wine, a present lately made him by the Comte de Guiche. He spoke all English and not ill. He told us that he was one of the oldest living that had been in the West Indies, where he was when a boy with the first that went thither, and he is now 63 years old, yet he looks very fresh coloured and lusty,—under his years he looks, and is dressed perfect citizen-like in a plain velvet coat. We stayed but little with him for it was the morning: he had invited us for the afternoon but we were to be gone.'[2] A very similar account is given by the English ambassador, Sir William Temple, who wrote that he never saw De Ruyter 'in clothes better than the commonest sea-captain, nor with above one man following him, nor in a coach. And in his own house, neither was the size, building, furniture, or entertainment, at all exceeding the use of every common merchant and tradesman in his town.'[3] He made a similar impression on Spanish and Italian grandees, one of whom, the itinerant Grand Duke of Tuscany, noted that his personal appearance was rather rougher than that depicted in his official portraits. It may be added that De Ruyter's wife was equally unashamed of her working-class origin, doing her own marketing and much of the family washing. This despite the fact that the admiral was by now a really wealthy man and left a very substantial fortune at his death.[4]

'The Hollanders exceed us in all things but envy', wrote John Evelyn in 1672, and this admission explains why the third Dutch war which broke out in that year was at first far from being unpopular in the country at large. Most seventeenth-century Englishmen regarded Dutch competition in a light very similar to that in which many people regard German or Japanese trade rivalry to-day. It was an article of faith with them that they could never compete with the Dutch on equal terms as the latter would always

1 Now no. 131, Prins Hendrikkade, and a national museum.

2 J. Vernon to Sir Joseph Williamson, The Hague, 2/12 February 1671/2, in J. Beresford, *The Godfather of Downing Street* (1925), p. 259.

3 *Observations upon the United Provinces of the Netherlands* (ed. 1676), p. 128.

4 An English friend of the family wrote to the Rev. Thomas Pots at Flushing on the 11 February 1673: 'I enclose my opinion how your town might be made harmless in these times of calamity. I know you and your father-in-law, De Ruyter, have great estates, and it's more than a hazard that Holland is not gone. It, therefore, in my opinion, concerns you the more to secure what you have in Zealand by timely circumspection' (*Cal. S.P. Domestic*, 1672–1673, p. 506). If this was an attempt to wean De Ruyter from his allegiance, it failed.

either undersell or outbid them. France, which in the second half of the previous war had been allied with the Dutch, was now allied with England, and the Anglo-French naval forces were numerically greatly superior. De Ruyter's genius never appeared to better advantage than in the famous summer campaigns of 1672 and 1673, when he showed himself to be 'the saviour of the fallen fatherland' by sea just as the young Prince of Orange was his country's salvation ashore. De Ruyter's successive victories at Solebay (7 June 1672), the Schooneveld (7 and 14 June 1673) and Texel (21 August 1673), undoubtedly saved the Netherlands from an invasion by sea which they were in no condition to withstand, and they boosted the national morale at a time when nearly everything seemed lost, three out of the seven provinces being occupied by the French.

His handling of his fleet in the face of numerically superior opponents whose ships were also heavier gunned and better manned again aroused the admiration of his enemies. The Earl of Sandwich's flag-lieutenant was fished out of the sea by the Dutch during the burning of the *Royal James* at the battle of Solebay, and brought aboard the *Zeven Provincien*. De Ruyter ordered that he should be given some clothes and sent below out of harm's way. But the Englishman 'asked to be allowed to stay on deck, and see how the battle would go, saying to Lieutenant-admiral de Ruyter: "Sir, is this fighting? It is not yet noon and there is more done already than in all the four days of 1666."' His request was granted, and supping that night with his Dutch opposite number and some other officers, when he heard De Ruyter's name mentioned he burst out: 'Is that an admiral? He is an admiral, a mate, a sailor, and a soldier. Yes, that man, that hero, is all these things at the same time.'[1] The French were equally outspoken in their praise of De Ruyter's leadership during this war. The Chevalier de Valbelle wrote after the first battle of Schooneveld a year later: 'M. de Ruither, qui a toujours l'oeil ouvert sur sa flotte, et qui est assurement fort habile. . . revira sur nous en bon ordre et en galant homme. . . . Je me confirme plus que jamais dans l'opinion que j'ay des Hollandais: ils ont témoigné plus de finesse, d'habilité et de courage en cette bataille qu'en toutes les autres qu'ils ont donnés.'[2]

When the war with England was over and De Ruyter had returned home from an unsuccessful cruise to the West Indies and an abortive attack on the island of Martinique, he received a cordial invitation from King Charles II to pay a visit to London. The invitation was warmly seconded

1 G. Brandt, *Leven en bedryf* (1687), pp. 671, 675. Curiously enough, almost exactly the same words were used of the Duke of York's behaviour in this battle by Captain John Narbrough. Cf. R. C. Anderson [ed.], *Journals and Narratives of the Third Dutch War* (1946), p. 97.

2 De Valbelle to Seignelay, 8 June 1673, in Colenbrander, *Zeeoorlogen*, Vol. II, pp. 238–45.

by the Duke of York, Prince Rupert, the Earl of Ossory, and other English leaders in the late war; but, writes Brandt, De Ruyter 'who did not care for courts and preferred a plain burgher's life, thanked the king for the honour he had shown him, and politely declined the invitation'. He also declined a proffered English knighthood, although he had accepted titles of nobility from the kings of France (1666) and Denmark (1660). Charles II had to be content with conferring a knighthood on the old man's only surviving son, Rear-admiral Engel de Ruyter, and with entertaining Cornelis Tromp, whose prowess with the bottle certainly made him a more suitable guest for the 'very merry, dancing, drinking, laughing, quaffing, and unthinking'[1] Court of Whitehall.

De Ruyter's remarkably strong constitution now began to show signs of strain and in 1675–6 he suffered considerably from toothache, colic, and the stone. But although he was now an old man, a rich man, and a sick man, the call of duty was still as strong with him as ever, despite these three weighty inducements for spending his last years in peaceful retirement. In June 1675 the States-General decided to send a small fleet to the Mediterranean to help the Spaniards defend rebellious Sicily against the French. The Spanish government insisted that De Ruyter should command this fleet, and Spain had helped the Netherlands so loyally and effectively in 1672–4, that the Prince of Orange and the States-General strongly urged him to go. The old man's reply is famous: 'You have not to ask me but to order me. Even if I was ordered to fly our country's flag on but a single ship, I should go to sea therein, for wherever the States-General will trust their flag I will risk my life.' He left on his last expedition in August 1675 with considerable misgiving. He was not given adequate ships, supplies or support by the home government; and the Spanish authorities, though lavish with promises, were more than backward with performances. Just before embarking he said to a friend: 'Goodbye to you and not just goodbye, but goodbye for ever, since I do not expect to return. I will perish on this expedition, I feel it.'

His forebodings were justified. Mortally wounded in action against the French off Syracuse (22 April 1676), De Ruyter died a week later after bearing the excruciating pain with exemplary fortitude and truly religious resignation. It was in keeping with his life that his death was also mourned by his enemies. When the *Eendraght* with his coffin on board finally left Sicily for home, King Louis XIV, not usually filled with undue consideration for the *marchands de fromage* as he called the Dutch, gave orders that the flagship was to be saluted from the shore if she passed within sight of any French harbour. The first individual biography of De Ruyter was

1 Dryden, *Secular Masque*, p. 40.

published the next year in England, and although the anonymous author carefully avoided any mention of the Medway disaster, he was otherwise not sparing in his hero's praise nor was his concluding sentence mere hyperbole. 'In fine, he was so good a man, so devout and pious a Christian, so stout a soldier, so wise, expert, and successful a General; and so faithful, trusty, and honest a lover of his country, that he deserves justly to be recommended to posterity as an ornament of his age, the darling of the seas, and the delight and honour of his country.'[1]

When De Ruyter died at the age of sixty-nine, he had served fifty-eight years at sea, fought in seven wars and more than fifty sea-fights, and exercised the supreme command in seven major battles. His countrymen claim him as the outstanding admiral of all time and as the embodiment of all the homely civic virtues. Both claims are, I think, fully justified, although present-day admirals can hardly be compared with those of the days of sail. The most obvious comparison is Nelson, but De Ruyter's achievement was even greater than Nelson's. Had Nelson never existed, it is still virtually certain that Britain would have won the maritime struggle with France between 1793 and 1815. But had De Ruyter not been De Ruyter, it is almost equally certain that the Dutch fleet would have been overwhelmed in 1672 or 1673, and that the United Provinces of the Free Netherlands would not have remained either united or free.

No English admiral has had to face such a superiority of real force as De Ruyter did in 1672–3. At the first battle of Schooneveld, for example, De Ruyter had 52 ships of the line as opposed to 76 of the Allies, and as stated above, most of the French and British warships were heavier gunned and manned than their Dutch opposite numbers. Indeed, throughout our Dutch wars the English had the triple advantage of a vastly superior strategic position, larger and better gunned warships, and more homogeneous crews—for the Dutch fleet was always manned with a fair proportion of German and Scandinavian seamen.[2] Moreover, the English were usually fit and always eager for battle, and had the great victories of Robert Blake to inspire them. Nelson, on the other hand, had to face French and Spanish crews which were, for the most part, nothing like so well trained and experienced as his own.[3] The French and Spaniards in the wars

1 *Life of De Ruyter* (1677), p. 115. Even Brandt, who criticized this work as being a mixture of fact and fiction, admitted that he could not improve on this summing-up. Cf. *Leven en bedryf*, p. 989.

2 Sir William Coventry pointed out that as regards trade rivalry all the natural advantages—'winds, good ports, and men'—lay with the English. The same thing was true of the strategical situation to a great extent. Cf. C. Wilson, *Profit and Power*, p. 128.

3 Of course, some officers, such as Cosmao Kerjulien and Charles Baudin, were the equal of any British they ever met, but the foregoing is true as a broad generalization.

of 1793–1815 almost always acted on the defensive, and they had a long series of defeats at the hands of the Royal Navy to depress them. Nelson's problem was not so much to beat their fleets as to find them and force them to give battle. Finally, Nelson's senior officers were 'a band of brothers', whereas the mutual jealousy and dislike of many of De Ruyter's senior officers for each other were notorious—although in this respect his opponents were not much better off, for the flag-officers of King Charles II's fleet formed anything but a mutual admiration society.

De Ruyter's outstanding qualifications as a professional seaman and admiral were reinforced by his remarkable ability to get on with all sorts and conditions of men. These included a Negro slave who served with him as a youth and later proved an invaluable ally as a chief in his own country during the Guinea expedition of 1665; the Moorish marabout, Sidi Ali ben Muhammad ben Musa; English planters in the Barbados; and the Duke of Medina Celi, Viceroy of Andalusia. He also served both the Grand Pensionary, Johan de Witt, and his successor and bitter enemy, the young Prince of Orange, with equally unwavering loyalty. Not that De Ruyter was devoid of human failings, or that he was never criticized by any of his subordinates. The ignoble ruse by which he captured the French captain La Lande in 1657 can only be described as treacherous, particularly since the Frenchman had treated him with singular chivalry many years previously when their relative positions were reversed.[1] His temper was not always under perfect control, but the acidulous criticisms made of him by vice-admirals Tromp and Meppel were palpably unfair. These two officers were themselves almost entirely to blame for their quarrels with De Ruyter. The Admiral's defects are insignificant in comparison with the frank and noble side of his character as evidenced (for instance) by his testimony to the loyalty of the brothers De Witt at a time when they were being persecuted with a savage malice which forms an indelible stain on Dutch history.

The secret of De Ruyter's tactical genius cannot be expressed by a landsman, as I admitted at the beginning of this article. But I feel that David Hannay came near the heart of the matter when he wrote: 'De Ruyter had just the needful combination of cool, self-possessed caution which made him refrain from blindly rushing at a threatening danger, and of intrepidity which nerved him to strike hard when he saw that a blow could be successfully delivered.'[2] The pious old admiral would not have agreed for, as we have seen, he always stressed that the result of the battle was due to God alone—'aan Godt alleen den eer'. On the other hand, Pepys records

1 C. de la Roncière, *Histoire de la Marine Française*, Vol. v (Paris, 1920), pp. 218–23; P. J. Blok, *M. A. de Ruyter*, pp. 56, 136–7.

2 D. Hannay, *Short History of the Royal Navy*, Vol. 1, p. 428.

De Ruyter as having said apropos of his tactics in 1673: 'They will fight with me when I please, but I won't when they please', which affords some confirmation of Hannay's view. I think we may leave the last word with James Duke of York, the great Dutchman's antagonist in the fires of Solebay, who told Samuel Pepys many years later that De Ruyter was the greatest admiral 'that ever to that time was in the world, [and] that never reported untruths or spoke less of his enemy than they deserved'.[1]

1 E. Chappell (ed.), *Tangier Papers of Samuel Pepys* (1935), pp. 247, 314.

DEAD RECKONING AND THE OCEAN VOYAGES OF THE PAST

By C. V. Sölver and G. J. Marcus

THE modern theory of trans-atlantic passages made solely by dead reckoning, so the present writers understand, has to-day been pretty generally accepted in academic circles. As the problem is essentially one of practical navigation, however, attention must be drawn to certain vitally important factors which would appear to demand more careful consideration. It is the object of the following paper to examine this theory anew in the light, not only of the researches of professional historians, but also in that of the experience of mariners throughout the centuries.

The ocean voyages of the Norsemen form one of the most interesting and significant chapters in the annals of deep-sea navigation. The Norsemen were in the truest sense of the term *hafsiglingarmenn*, 'deep-water sailormen', voyaging to and fro between the Scandinavian homeland and Greenland, Iceland, and the Faeroe Islands. Five hundred years and more before Christopher Columbus arrived in the Bahamas, one of these crews, forced off their course in a gale, had sighted the eastern seaboard of North America —to the coastlands of which their compatriots are recorded to have paid occasional visits until as late as the year 1347. To account for the success and continuance of these early ventures it has been argued by some that the Norsemen of the Viking era must have possessed some kind of magnetic compass.[1] Much, understandably enough, has been made of the courage and endurance of their crews.[2] Various attempts have also been made to attribute their achievement to a mysterious quality called 'instinct'—a sort of sixth sense which is supposed to have guided these Norsemen unerringly across the waste of waters. None of these explanations would appear very convincing to a sailor.[3]

Whatever may be the merits of Professor S. E. Morison's well-known theory concerning the navigation of Christopher Columbus, it is manifestly

1 See 'Sólarsteinn' in Cleasby and Vigfusson's *Icelandic-English Dictionary*; Heinrich Winter, 'Who Invented the Compass', *The Mariner's Mirror*, Vol. XXIII (1937), p. 99; Dorothy Burwash, *English Merchant Shipping 1460–1540* (1947), pp. 5, 13. But see also G. J. Marcus, '*Hafvilla*: A Note on Norse Navigation', *Speculum*, Vol. XXX (1955), pp. 601–5; P. G. Foote, 'Icelandic sólarsteinn and the Mediaeval Background', *Arv*, Vol. XII (1956), pp. 26–40.

2 Sir Winston Churchill, *A History of the English-Speaking Peoples*, Vol. I, p. 72.

3 See S. E. Morison, *Admiral of the Ocean Sea*, Vol. I (1942), XXXV, 248.

not applicable to this early ocean traffic of the Norsemen. In the first place, the navigational conditions in the southern area of the Western Ocean are widely different from those obtaining in the northern. Secondly, Morison states that the only instrument indispensable for Columbus was the mariner's compass, and the other indispensable aid to navigation was his collection of sea charts.[1] The Norsemen, over a period of several centuries, possessed neither the one nor the other.

Year after year, decade after decade, this ocean traffic of theirs was carried on with no more than a reasonable proportion of casualties over what was, even in the spring and summer months, one of the wildest and most hazardous sea-routes in the world. For here was no region of steady trades and seasonal monsoons. In the unsettled conditions of these high latitudes the weather could never be counted on for long. Sudden shifts of the wind were of common occurrence; the heavens were often obscured behind mist or cloud. With their sail-yard squared in to a spell of fair winds mariners might keep their craft more or less on the right course, even when the celestial bodies were invisible;[2] and up to a point their dead reckoning would see them through. But consequent upon calms, beam seas, head-winds, squalls, gales, fogs, and the sullen overcast skies of the high North, it often happened that they lost their reckoning altogether, and fell into the state of *hafvilla*, of which mention is frequently made in the sagas.[3] The *Flateyjarbók* tells how Bjarni Herjólfsson, on passage from Iceland to Greenland, was blown out of his course. It seems that on putting out from Iceland 'they sailed for three days before they lost sight of the land; but then the fair wind failed, and there came north winds and fogs, and they did not know where they were going, and it went on in this way for many days'. The *Laxdoela saga* tells a similar story. 'They met with bad weather that summer. There was much fog, and the winds were light and unfavourable, what there were of them. They drifted far and wide on the high sea. Most of those on board completely lost their reckoning.' The *Illuga saga* mentions 'a thick fog which did not lift for many days', following which 'they met with bad weather and were, in fact, hopelessly adrift'. These numerous references to *hafvilla* show beyond all doubt that the Norsemen's D.R. not infrequently failed them, and needed to be checked by an occasional observa-

1 See Carl V. Sölver, *Imago Mundi* (1951), p. 216.

2 For a limited period it would probably be possible to carry on 'blind', as it were. Thus one of the present writers recalls how in 1897, while running the easting down in a Scottish barque, their binnacle was carried away; and for two successive days the helmsman had to steer by the direction of wind and sea, without any compass.

3 *Hafvilla* means not only 'not knowing the way at sea', but also 'not knowing where they were going' (i.e. they had lost all sense of direction).

tion of the celestial bodies,[1] as well as by such adventitious aids to navigation as the movements of sea-birds, whales, and other *fauna*, the reflexion of ice-floes and the colour and run of the seas.

According to Morison, Christopher Columbus was a heaven-sent dead-reckoning navigator.

Consider what amazing feats of dead reckoning have been attributed by this authority to the 'Admiral of the Ocean Sea'. 'When sailing for a place already known, he always managed to hit it on the nose; for examples, note his return passage of the Second Voyage, the leg of the Third Voyage from Margarita to Hispaniola (imagine the amount of dead reckoning to close the last gap of a circuit that took in Hispaniola, the Azores, Spain, the Canaries, Cape Verdes, Trim and Margarita); the outward passage in 1502, and the directions given to the Hispaniola fleet in 1498.'[2] On his Second Voyage Columbus discovered the shortest route from Europe to the West Indies. When on the same voyage he sent home from Hispaniola, in February 1494, twelve out of the seventeen vessels that he had under his command, he provided them with sailing directions for the passage. 'Before taking off for the "big jump", the Admiral gave all his ship-captains sealed instructions to be opened if they became separated. This instruction is one of the innumerable lost Columbian documents that we wish to Heaven had been preserved, for it contained the Admiral's sailing-directions to the New World of his discovery. Obviously, from the landfall he made on November 3, they must have been very accurate.'[3]

How did he do it? Not by any device of nautical astronomy, says Morison, who insists that celestial observations, for ocean navigation, were not used at all in the time of Columbus—not even by the Portuguese: that the Admiral's few recorded celestial observations prior to 1504 'were of the most cock-eyed description': that Columbus, to all intents and purposes, was 'a dead-reckoning navigator pure and simple': that all his four voyages 'might have been accomplished just as well without a single observation of Polaris'.[4]

Certain other partisans of the dead-reckoning theory go much further than Morison. They imply that, not only Columbus and his contemporaries,

1 Such excerpts as the well-known sailing directions for the Greenland passage contained in the *Hauksbók*, and various others in the thirteenth-century Icelandic sagas, *plainly imply latitude sailing*. See Nils Vigeland, *Norge på Havet* (1953), pp. 36, 39–41, 82; Marcus, 'The Navigation of the Norsemen', *The Mariner's Mirror*, Vol. xxxix (1953), pp. 120-7; Sölver, *Vestervejen om Vikingernes Sejlads* (1954), pp. 28–33, 105–7.

2 Morison, *American Neptune*, Vol. 1 (1941), p. 136.

3 Morison, *The Second Voyage of Christopher Columbus* (1939), pp. 30–1.

4 Morison, *Admiral of the Ocean Sea*, pp. 224, 251–2, and *American Neptune*, Vol. 1, pp. 135–6.

but also their successors in the early decades of the following century, relied, in point of fact, on dead reckoning; and that, in the light of recent research, the old belief that English mariners were at this time far behind the Latins in the theory and practice of deep-sea navigation can no longer be sustained. To the present writers, however, it does not seem that anything like conclusive evidence has been cited in support of this drastic revision of our former beliefs in the matter.

Morison freely admits that 'no such dead-reckoning navigators exist to-day'; and to account for Columbus's outstanding achievement on his outward passage in 1493 he suggests that 'the Admiral must have gone over the dead reckoning of his First Voyage with learned mathematicians in Spain, and worked out a correct course from the Canaries to the Antilles'.[1] The Professor presents by far the strongest case which has so far been argued for the dead-reckoning theory. Nevertheless, if the detailed history of Columbus's passages be scrutinized with a seaman's eye, it immediately becomes apparent that conditions must and did from time to time arise under which Columbus, in fact, could not have relied on his dead reckoning. After all, the Admiral had to sleep sometimes; and during his periods of repose he could not possibly have anything like the same certainty as to the vessel's course and speed when somebody else was on watch. It was admittedly fortunate for Columbus, as Morison remarks, that all his Atlantic passages, except one, were made in regions of the ocean where the force and direction of the currents constituted a comparatively minor factor. Still, these currents existed and had to be taken into account. Also there were such factors as leeway, steerage errors, course and distance made good, and compass variation. Moreover, all the difficulties inherent in dead-reckoning navigation were immensely increased when the expedition ran into bad weather—as it did on the homeward passage of the First Voyage in 1493.[2] In short, Morison appears to deal with the formidable arguments that may be raised against the dead-reckoning theory altogether too lightly; and in explaining the navigational methods he supposes Columbus to have used he makes this revealing comment: 'So, in order to determine his daily position at sea, and trace his course across the unknown stretches of the Western Ocean, Columbus was dependent on dead reckoning (D.R.), which means simply laying down your compass course and estimated distances on a chart. That is not so easy as it sounds.'[3] The concluding statement would surely be regarded by the professional sailor as a masterpiece of understatement.

1 Morison, *The Second Voyage of Christopher Columbus*, p. 31.
2 See Sölver, *Imago Mundi*, pp. 212–16.
3 Morison, *Admiral of the Ocean Sea*, Vol. I, p. 244.

An ocean passage made solely by dead reckoning is certainly possible once in a way; *but not as a regular thing*. In the period under review we have to reckon with, not only Columbus's own successive crossings of the Western Ocean, but also with the sailing directions supplied by the Admiral to the many other ships which voyaged to and fro between Spain and the New World.[1] In a word, it is not a matter of an occasional lucky passage, but of something very like regular ocean traffic. Even the partisans of the dead-reckoning theory appear to entertain doubts, at times, whether dead reckoning alone will in truth suffice to solve the problem in the face of all the unpredictable factors present in dead-reckoning navigation.[2] Morison himself alludes to the effective use made by Columbus of celestial observations on the return passage of the First, and on the outward passage of the Second, Voyage.[3]

It is fairly clear that at any rate the Portuguese did not rely on dead reckoning, and on dead reckoning alone, in their navigation to the East.[4] In the sailing directions given by Vasco da Gama to Cabral in 1500 the latter was instructed to stand to the southward until he was in the latitude of the Cape of Good Hope, and after that to run his easting down. Some

1 It is to be noted also that a number of very able mariners, including Juan de la Cosa—one of the most skilful and accomplished navigators of his time—received their training under Columbus.

2 'When the task was to lay a course westward over the Atlantic and to make the same landfall which one's predecessor, Cabot or Columbus, had reported; when soundings and sea-marks and the other paraphernalia of coastwise sailing were out of the question; then observations were the only resource': see Dorothy Burwash, *English Merchant Shipping, 1460–1540*, p. 14. See also Professor E. G. R. Taylor in the *Journal of the Institute of Navigation*, Vol. 1, p. 286: 'The practice of following a line of latitude across the ocean depends, of course, upon latitude observations.'

3 On the first occasion, Columbus altered course to the eastward when he judged by the height of the Pole-star that he was somewhere near the latitude of St Vincent; and he then ran down the parallel of his destination. Apparently he made this calculation by simple ocular observation. Nor was he more than a couple of degrees or so out in his reckoning. Morison has argued from the second occasion that Columbus was familiar with the principle of middle latitude sailing. 'It is the statement that he sailed his Second Voyage on the 24th parallel that interests us here. Columbus took his departure that voyage from Gomera, on about latitude 28° N. His furthest south was the south coast of Jamaica, a little under latitude 18° N. The average, or middle latitude,. . . was therefore 23°—a mistake of only one degree. This calculation must certainly have been based in part on observations of Polaris for latitude.'

4 That the fallibility of dead-reckoning navigation was well enough known in Columbus's own day is apparent from the following excerpt from a Portuguese source. 'But after they [the Portuguese] wished to navigate in the open, losing sight of the coast, and standing out into the wide ocean, they learned how many deceptions they met with in their estimation, and judgement of the day's run; for, according to their method, they allowed so much way to the ship in the twenty-four hours, both by reason of the currents, and for other secrets which the sea possesseth, of the truth of which navigation by altitude [latitude] is a very clear demonstrator': see Gaspar Correa, *The Three Voyages of Vasco da Gama*, ed. Hakluyt Society (1869), p. 452.

time later, in 1506, Quirini, the Venetian ambassador in England, explained in a report to the Senate how the Portuguese navigated to the Indies: by means of the astrolabe, he declared, they learn when they reach the line, and afterwards they sail south for about 2100 miles, until they calculate by the astrolabe that they are thirty-five degrees south of the equator, and thereby they know they are in the latitude of the Cape of Good Hope; in this long voyage they always navigate with the chart and compass...they also use the astrolabe, by which they calculate the altitude of the sun, and consequently, when it is midday, they discover how many degrees they are distant from the line, and therefore know how near or far they are from the places that they ought to avoid, or the ports that they should seek.[1]

It would also appear improbable that the passages made by John Cabot to and from North America, and those between Europe and Greenland towards the close of the fifteenth century, were made solely by dead reckoning. As has already been said, the navigational conditions which—as Morison justly observes—certainly favoured Columbus, were very different from those obtaining in the high North.

During the era of the great discoveries perhaps the classic example of the extreme difficulty—not to say impossibility—of keeping a good dead reckoning throughout an ocean passage of a good many hundreds of miles is the enormous error made by Magellan's pilot, Francisco Albo, in estimating the distance between Cape Fermoso in the Straits of Magellan and the Philippine Islands. Actually Albo was out in his reckoning by no less than 53 degrees: which plainly shows how little dead reckoning was to be relied on.[2]

It was because they knew that they could not safely trust their reckoning that mariners were accustomed to steer for the parallel of their destination and then alter course to the eastward or westward, as the case might be, until they made the land. Latitude sailing was practised by Vasco da Gama and his successors sailing to the East: in 1500, in the sailing directions which Pedro Cabral received from Vasco da Gama, the former was advised to steer to the southward until he arrived in the lattitude of the Cape, and then to shape an easterly course for the Indian Ocean. The survivors of Magellan's expedition (1519–20) shaped a south-westerly course from Banda until they arrived in the parallel of the Cape and then steered due west; later, from St Helena they shaped a north-westerly course until they arrived in the

1 St Mark's Library, Venice, *Sanuto Diaries*, Vol. v, vi, 282.

2 B.M.: *Additional MSS.* 17,621. Some fifty years later the deficiencies of dead reckoning are very clearly revealed in the sixteenth-century Danish sailing directions, Laurenz Benedicht's *Søkartet*: see *Tidsskrift for Søvaesen*, 85 Aargang (1914), pp. 178–9.

latitude of the Azores and then sailed eastward to the islands. In the second half of the sixteenth century vessels from north European ports bound for Lisbon or Cadiz were accustomed to stand to the southward across the open sea until they reached the latitude of their destination, and then alter course to the eastward. On his return passage from the north-west in 1577 Frobisher made his southing until he arrived in the latitude of Scilly, and then steered an easterly course along the parallel of his destination. On Gilbert's voyage to Newfoundland in 1583 the expedition was instructed to endeavour 'to keep in the height of 46 degrees'—which was the latitude of their destination, Cape Race; and on the return passage the squadron stood to the northward until they had arrived in the 'height', or latitude, of England. The great Elizabethan navigator, John Davis, returning from his voyage to the north-west in 1587, sailed down to the latitude of the Channel, and then shaped an easterly course until he arrived off his home port—Dartmouth. Cavendish, on his voyage round the world in 1586–8, made the Ladrones group and then sailed east to the Philippines; later, he sailed north from St Helena until he was in the latitude of the northernmost Azores, and then 'haled east, and east by south' until he sighted Flores and Corvo. The Earl of Cumberland, bound for the Azores in 1589, first sailed down to lat. 39° N. (which was the latitude of his destination), and then steered east for the Azores.

Similarly, it was owing to the impossibility of keeping a good dead reckoning that the Portuguese, and after them the Dutch, were careful to keep a sharp look-out for birds and other adventitious aids to navigation on their ocean passages.[1]

Early in the seventeenth century the Dutch, who had become by far the most skilful navigators of their day, began to follow a new and better track on the outward passage between the Cape and Batavia. Having rounded the Cape, they now ran their easting down in approximately lat. 40° S. before turning north for the Straits of Sunda. The Dutch navigation to the East provides further examples of the inaccuracies inherent in dead reckoning. Despite their skill and their world-wide experience the Dutch found that their dead reckoning was but 'a blind and stupid pilot'. It was, in fact, largely on account of their uncertainty as to the course and distance made good that so many of the Dutch East Indiamen were lost while running their easting down. Thus in 1617 the ship *'t Wapen van Amsterdam* was cast away on the south-east coast of New Guinea. In 1627 an entire Dutch squadron narrowly escaped a similar fate. 'We were less than half

1 Quirono da Fonseca, *Diarios da Navegação* (Lisbon, 1938), *passim*; *Het Aandeel der Nederlanders in de Ontdekking van Australië 1606–1756*, ed. J. E. Heeres (1899), pp. 12, 53. Cf. *The Voyages of the Elizabethan Seamen*, ed. E. J. Payne (1907), p. 397.

a mile's distance from the breakers before perceiving the same, without being able to see land. If we had come upon this place in the night-time, we should have been in a thousand perils with our ship and crew. In the plane charts the reckonings of our steersmen were still between 300 and 350 miles from any land, so that there was not the slightest suspicion of our being near any.' In the years to come there were to be a good many more such cases.[1]

One of the most striking illustrations of the fallibility of dead reckoning is provided by the innumerable disasters which have occurred, century after century, at the entrance to the Channel. Two of our squadrons met with very narrow escapes in the latter half of the seventeenth century. On the return passage from Cadiz Sir John Narbrough, with his entire squadron, in the small hours of 22 May 1673, became 'entangled with rocks called the Bishop and Clerks' and was very nearly lost. 'Our being northerly more than expectation', observed Narbrough, 'is by the current that do constantly set northerly, the soundings also deceived men in their depth and ground.' Ten years later, on the return passage from Tangier, Lord Dartmouth and his squadron likewise lost their reckoning. 'Strange the disagreements', observed Pepys (who had accompanied Dartmouth on this mission) in his journal on 29 March 1684, 'in so fair weather with so fair a wind immediately upon a fair observation and clear soundings at 65 fathoms and 49° 34′ latitude, among our navigators about the entrance into our Channel, my lord and Mr Phillips being very positive that we were shot to the Eastward of Scilly, while Sir William Booth with the Master and mates were of opinion that we were yet to the westward, and one part of them apprehensive of our running upon the French coast, and the other upon the English, some being for lying by all night, others for sailing boldly forwards, as we did, due East.'[2] The dangers of the Channel approaches and the chronic inaccuracy of naval dead reckoning were so well understood that it became the custom to send out cruisers to the Soundings to meet the Fleet on its return from the Mediterranean.[3] Early in the eighteenth century there befell one of the greatest disasters in our naval annals. On the evening of 22 October 1707, Sir Clowdisley Shovell's flagship, the *Association*, together with the *Eagle* and the *Romney*, struck on the Bishop and Clerks and was lost with all hands. 'We were much to ye Northward of what was

1 Heeres, *op. cit.* p. 52 *et passim.*

2 *The Tangier Papers of Samuel Pepys*, ed. Edwin Chappell, Navy Record Society, Vol. LXXIII, p. 248. On the outward passage the masters were variously twenty-five to seventy leagues out in their reckoning, 'so that had it not been for the calm we have had', declared Pepys, 'or if we had come upon them in the night, the whole fleet probably would have been upon the Burlings' (*ibid.* pp. 126–7).

3 J. H. Owen, *War at Sea under Queen Anne* (1938), p. 192.

expected', the captain of the *Torbay* wrote in his journal, 'and likewise more to the Eastward'.[1]

Notwithstanding the fact that the eighteenth century witnessed a notable advance in the theory and practice of navigation recourse was still had to latitude sailing; since dead reckoning was plainly not to be relied on. It was for this reason that the solution of the longitude problem was, as the late Commander Gould justly observed, 'a matter of the most urgent and vital importance'. Anson, on his great voyage of circumnavigation (1740–4), spent more than a month struggling to round Cape Horn; and when, according to his dead reckoning, he was some ten degrees west of Tierra del Fuego, he at last stood to the northward, it was only to discover that, owing to the easterly set, he was still on the wrong side of 'Cape Stiff'.[2] Later in the same voyage there was a very good example of what might be expected to occur when the mariner, having rashly abandoned latitude sailing, chanced it on dead reckoning. For, instead of steering for the latitude of his destination, Juan Fernandez, a good distance to the east or west of it, and then sailing along that parallel until they sighted the island, Anson steered (as he believed) directly for the island; with the result that they arrived in its latitude without sighting it, and, being uncertain whether it lay to the eastward or the westward, they first sailed eastward almost as far as the Chilean coast, searching for the elusive island, and then had to return westward again before at last sighting Juan Fernandez, losing a large number of the crew through sickness.[3] Again, James Cook, sailing for New Zealand from the Society Islands, in 1769 was some 4 degrees out in his reckoning when he arrived off the coast of New Zealand.[4] *Not even the best of navigators could rely on his dead reckoning.* 'We had no chronometers', Admiral Sir George Elliot recorded, 'and knew nothing of lunar observations, even as late as 1803. I remember some of our squadron between three and four hundred miles out of their longitude in going from Gibraltar to the West Indies.'[5] Towards the close of the pre-chronometer era, Maskelyne wrote in the preface to his *British Mariner's Guide*: 'Daily experience shows the wide uncertainty of a ship's place, as inferred from the common methods of keeping a reckoning, even in the hands of the ablest and most careful

1 P.R.O.: Ad. 51/4373. Cf. Joshua Kelly, *The Modern Navigator's Compleat Tutor*, Vol. 1 (1724), p. 434; James Rennell, *Observations on a Current*, etc. (1793), p. 4; J. Burchett, *A Complete History of. . . Remarkable Transactions at Sea* (1720), pp. 733–4.

2 George Anson, *Anson's Voyage round the World* (1748), p. 82.

3 *Ibid.* pp. 105–7. See Kelly, *op. cit.* Vol. 1, p. 287.

4 William Wales, *Astronomical Observations*, etc. (1788), pp. 106–8.

5 A. H. Taylor, 'Admiral The Honourable Sir George Elliott', *The Mariner's Mirror*, Vol. xxxv (1949), p. 331. For some interesting examples of British warships which were out of their reckoning and lost, see William Gilly, *Shipwrecks of the Royal Navy* (1857), p. 61 *et passim*.

navigator. Five, ten, or even fifteen degrees are errors which no one can be sure he may not fall into in the course of long voyages.'

In the last century or so the mariner's knowledge of the world's winds and currents has immeasurably increased; sail has been almost wholly superseded by steam; navigational instruments have been evolved of which neither Leif Eiríksson nor even Christopher Columbus can so much as have dreamed. Now at last, surely, ocean passages made solely by dead reckoning will have become a practical proposition. Nor can it very well be denied that there were, during the period under review, a certain number of what at first sight appear to have been clear cases of regular ocean navigation by dead reckoning.

Some years before World War I the S.S. *Bovic* made a passage which was for long legendary in the White Star line. It is said that the *Bovic* steamed from the Tuskar to Nantucket in eight days without sights, running on dead reckoning; and she made a very good landfall. Several other such remarkable passages made by dead reckoning and by dead reckoning alone are known to the present writers. There can be no question but that dead reckoning—on occasion—could be surprisingly accurate, even in the stormy waters off Cape Horn. The late Captain Barker in his reminiscences of square-sail tells of one such case. 'We had been through nearly six weeks of unabating hell, and here we were, no more than fifty miles S.W. from St John's Point! The position obtained by taking cross bearings of the two extreme points of the island [Staten I] differed very little from the position by account.'[1] A somewhat similar experience is narrated by Captain Jones, who served his apprenticeship under Captain Barker shortly before World War I. 'As we approached the Strait of Le Maire the weather closed in, with heavy squalls of rain and sleet, which prevented noon observations on two successive days. Nevertheless, the Old Man carried on, with a full press of sail, relying on his dead reckoning to make the Strait in safety.' As they approached the land, the weather cleared sufficiently for them to get a fix. 'The Old Man himself went aloft to verify the report, and we found the ship dead in position, when bearings were taken, as we closed in on the land.'[2] Mention must also be made of the large numbers of Newfoundland schooners which used to sail every year for European ports. For the most part their skippers' notions of navigation were—to say the least of it!—primitive in the extreme. Here, to all appearances, was an instance of regular ocean navigation by dead reckoning.

In the nineteenth century there were certainly quite a number of masters in sail who prided themselves on their dead reckoning (though few of them,

1 J. P. Barker, *The Log of a Limejuicer* (1934), p. 209.
2 W. H. S. Jones, *The Cape Horn Breed* (1956), pp. 274–5.

perhaps, would have gone as far as that Yankee skipper who boasted that, given the necessary experience, one required neither chart nor sextant for crossing the Western Ocean). Old Simon Gunn, master of the barque *Lurlei* in the early 'nineties, has some claim to be accounted, to some degree, a 'dead-reckoning man'. 'I ain't no man o' book-learnin'', he used to say, 'never went to school in my life. All I knows I learned m'self. The smart fellows call me an "old eighty-nine forty-eighter". No, mister, there ain't no frills on Simon Gunn. I can work a latitude by meridian altitude of the sun, find a longitude by chronometer, and keep a good dead reckonin'. I've been master over thirty years, and I've never stranded or lost a ship, or caused the underwriters any expense. Book-learnin', mister, may be all right to them as needs it, but I takes no stock in it. And I reckon Simon Gunn's as good if not better than the rest.'[1] Captain Barker, who sailed with him as mate, relates that, 'He was very proud of his ability to sail his ship through the eye of a needle by dead reckoning. Indeed, I often heard him boast that he did not care whether he obtained sights or not.' However, Captain Barker goes on to remark: 'There came a time when I believe he would have willingly parted with his much-prized whiskers in exchange for a glimpse of the sun.'[2] That is the crux of the whole matter. It is, after all, only a question of time—in relation to the conditions of wind and weather—before one's dead reckoning breaks down entirely.

Let us now examine some of the other cases. Against the memorable passage of the *Bovic* already mentioned is to be set the significant fact that her master, *still relying on his dead reckoning*, subsequently piled up, first, the S.S. *Suevic* on the Maenheere Rocks off the Lizard, and second, the S.S. *Highland Hope* on the Burlings. The Ellerman liner, S.S. *Swazi*, on passage across the Western Ocean during the winter of 1916–17, like the *Bovic* had no observations and ran on dead reckoning for several days on end, and, just before she made the land, discovered she was 150 miles out in her reckoning—a far commoner experience. As has been said earlier, it will probably never be known how many vessels have been lost, throughout the centuries, while running on dead reckoning off the entrance to the English Channel. One of the best-known cases is that of the S.S. *Minnehaha*. After working for three days on dead reckoning, on a course which should have taken her about six miles south of the Bishop, the *Minnehaha* on 18 April 1910 ran on the Scilly Rock at the back of Bryher Island—some thirteen miles off her course to the northward. At the ensuing Enquiry the Court found that the master 'in blind reliance on his dead reckoning and his line of soundings' proceeded with only 'some slight and inadequate change

1 Barker, *op. cit.* p. 35. 2 *Ibid.* p. 37.

of course'. Once again the inherent fallibility of dead-reckoning navigation had been made manifest. 'The result is a forcible illustration of the desirability of acting on the assumption that calculations based on dead reckoning and soundings may be wrong. The point is forced home in the present case by the fact of the skill and care which the Court recognizes were used by the master in calculating his position: but he failed to remember that those calculations might be vitiated by any one of several circumstances beyond his knowledge and control.'[1]

In spite of an occasional—very occasional—instance of successful dead reckoning off the pitch of the Horn, it is scarcely open to question that, under the conditions which usually obtained there, dead reckoning was little better than guess-work. Our member, Captain Sam Svensson, when in these waters, once discovered that his longitude was no less than four degrees out.[2] Year after year 'Cape Stiff' claimed its victims. In particular, Staten Island was a regular graveyard of square-riggers. The *New York*, ship, out of her reckoning, was stranded there on 21 August 1891. The four-masted barque *Bidston Hill*, after running on dead reckoning for twelve days, was wrecked there on 20 July 1905. The *Swannhilda*, ship, overrunning her distance, was stranded on Staten Island on 16 May 1910.[3]

1 *The Times*, 26 May 1910. Cf. C. H. Lightoller, *Titanic and Other Ships* (1935): 'One of our crack Atlantic Liners (I won't mention names) coming home from New York; instead of being well south of the Scillies, found herself north of these islands, and sighted the Seven Stones Lightship. This, despite the fact that the Captain was one of the most able and careful navigators on the North Atlantic.'

2 Alan Villiers, *By Way of Cape Horn* (1930), p. 129.

3 A high proportion of sailing-ship casualties will be found to have resulted from the masters' slipshod navigation and over-reliance on their dead reckoning. For instance, the master of the *Holt Hill*, barque, stranded on St Paul's Island, Australia, on 13 November 1889, was 'carrying a heavy press of sail when in vicinity of land without sights for three days'. The master of the *Viscount*, ship, which was stranded on the Falkland Islands on 10 March 1892, in spite of the fact that he had had no sights for several days actually shaped a course to pass within four miles of Beauchene Island. When the *Picton Castle*, barque, went aground on the Shipwash Sand on 21 January 1895, her master was 'steering a course from an assumed position only, and neglecting his lead in thick weather'. The wreck of the *Beechdale*, barque, on Long Island, in 1907, was attributed to 'the master's over-confidence in his dead reckoning'. To the same cause must also be attributed the stranding of the *Falls of Halladale*, ship, near Port Campbell in southern Australia, on 14 November 1908. In the last age of sail a good many masters relied only on their observations of latitude, and hove-to at night when anywhere near the land. Many a Cape Horner must have been thrown away through the inability of the master to take stellar observations. Thus the master of the *Bidston Hill* stated at the Enquiry that he had been working for nearly a fortnight on dead reckoning; but during this same period, the sun being invisible, the master of another vessel in the vicinity had obtained star-shots every morning and evening. There were hosts of these old 'eighty-nine forty-eighters' in sail. Really skilful navigators like Captain C. C. Dixon, master of the *Elginshire*, and, at a rather later date, Captain James S. Learmont, were few and far between. Most of the masters of the crack China tea clippers were very skilful navigators. Even so, dead-reckoning errors accounted for not a few wrecks and strandings in the China fleet.

Nor can the navigation of the Newfoundland schooners eastward-bound across the Atlantic be regarded as purely dead-reckoning navigation; for these vessels were sailing on well-frequented routes and used to obtain their position from any ship which came near enough for them to hail or signal. It is not without significance that a great many of them met their end on the homeward passage on their own fog-bound shores.

Many a square-rigger was thrown away through 'the effect of a set or current'. The following are a few typical examples: the *Duncan Dunbar*, aground on the Roccas, 130 miles north-east of Cape San Roque, Brazil, on 7 October 1865—out of her reckoning as a result of a current; the *Sobraon*, stranded up the British Channel, in 1866, when reckoning to have the Start abeam—northerly set; the *Beecroft*, stranded in the Orkneys in 1889—south-westerly set; the *Casket*, stranded on the coast of North Carolina on 13 September 1892—north-easterly current; the *Beechdale*, stranded on Long Island in 1907—south-westerly current; the *Star of the East*, aground on the Gold Coast, also in 1907—easterly set; the *Garthwray*, wrecked on the Chilean coast on 22 April 1924—northerly set.[1]

Even under the far more favourable conditions of steam dead-reckoning errors continued to be numbered among the most frequent causes of casualties, as may be seen from the significant evidence given at a great many wreck Enquiries during the last sixty or seventy years.[2] For example, it was found that the casualty was caused by 'the master trusting entirely to dead reckoning' (S.S. *Cerdic*, aground on the Northumberland coast on 24 December 1889); the stranding was owing to the master 'trusting to his dead reckoning and his experiences of previous voyages, and not altering his course off land when the weather thickened' (S.S. *John Elder*, stranded on Carranza Rocks, west coast of South America, in 1891); the master 'was under the impression that he was past the Fastnets' (S.S. *Memphis*, wrecked in Dunlough Bay, in 1896); the vessel 'not having made good her course, probably owing to some set or current' (S.S. *Athena*, wrecked on the Patagonian coast in 1901); 'when observations were obtained at night by the Pole Star they threw the vessel out of her assumed position considerably,

1 *Nautical Magazine, passim.* Innumerable examples of the known fallibility of dead reckoning might be cited from the private journals, ships' logs, etc., of the last age of sail. The following is a case in point. 'The *Cutty Sark* was now barely a week from Anjer, but, owing to the error in his chronometers, Captain Wallace dared not lay a direct course for Java Head, but, allowing for a margin of 80 miles, did not haul in for the land until he was in the latitude of the Straits.' I.e. the moment his chronometers failed him *the master had recourse to latitude sailing*, just as in the pre-chronometer era. See Basil Lubbock, *The Log of the 'Cutty Sark'*, p. 192.

2 It is to be observed that dead-reckoning errors exacted, from the Union Castle line alone, and within a comparatively brief period, a heavy toll of casualties; including the S.S. *Drummond Castle* (1896), the S.S. *Tantallon Castle* (1901), the S.S. *Newark Castle* (1908), the S.S. *Cawdor Castle* (1926), and the S.S. *Winchester Castle* (1936).

whereon the captain decided to trust his dead reckoning' (S.S. *Acara*, wrecked near New York, also in 1901); 'the master was not justified in relying entirely upon the patent log, and ought to have taken proper precautions to verify the position and distance run by the use of the lead' (S.S. *Suevic*, stranded on the Maenheere Rocks off the Lizard on 17 March 1907); 'the master...was over-confident in the dead reckoning of his position at noon, and should have verified it by soundings' (S.S. *Gowanburn*, stranded on 13 April 1907); 'the master attributed the casualty to the vessel being set to the eastward by a current of greater strength than he expected' (S.S. *Heraclides*, stranded on Hottentot Point, South-West Africa, on 26 October 1907); 'had he not neglected to take soundings...the master would have found that the position he had taken from the reckoning was not correct and that the ship was experiencing some unusual current' (S.S. *Mount Temple*, stranded on the coast of Nova Scotia on 2 December 1907); 'the Court found the cause of the wreck was a strong northerly set, and a miscalculation of the actual distance run' (S.S. *Roda*, on passage from Huevla to New York, lost on 13 February, 1908).[1]

All over the world variable sets and currents—often but little known, sometimes quite unpredictable—levied their toll from the shipping of all nations.[2] Steam as well as sail, as we have seen, still contributed its annual tally of vessels lost or stranded through errors of reckoning. The fog-bound shores of Newfoundland and Nova Scotia; the littoral of Chile and Peru; Cape Horn; the south-west coast of Africa; the Channel and the Baltic approaches; isolated rocks and islets such as the Casquets and Burlings; fishing-grounds like Iceland and Bear Island—were among the biggest graveyards of shipping in modern times. The high proportion of casualties due, in greater or lesser degree, to errors of account will be appreciated from even the most cursory glance through the files of the *Wreck Reports*, the *Times*, and the *Nautical Magazine*. Even so, these represent no more than a small minority of the errors actually made[3]—the majority, in all probability, will never be known.

Moreover, in a large number of cases errors of reckoning might be rectified in time by intelligent recourse to what was earlier described as the

1 *Nautical Magazine, passim.*

2 Hydrographic Department, Admiralty: *Channel Pilot* (1949 ed.), pp. 3–4; *South American Pilot* (1942), pp. 15–16; B. T. Somerville, *Ocean Passages for the World* (1923), pp. 59–74, 440–1, 457.

3 The following is a good example of such an error of account, which might very well have resulted in wreck or stranding. The barque *Lebu* was, in 1890, on her return passage from San Francisco. She had arrived in soundings without once having sighted land; her master had obtained good sights, and all had gone well—until, sailing up-Channel, she ran into fog. Working perforce on dead reckoning, her master all but piled her up on the Isle of Wight.

adventitious aids to navigation—e.g. birds, whales, ice-floes, clouds, colour and run of the sea, etc. While in mid-ocean one might very well steam on and chance it, in coastal waters running blind on dead reckoning was liable to involve immediate retribution—particularly on the coast, therefore, it was a common practice to keep a sharp look-out for such adventitious aids. Fishermen of the Shetlands and Iceland were accustomed to use the small auks, such as puffins and guillemots, to guide them when uncertain of their position. Gannets frequently served to pilot British trawlers to the entrance of the Pentland Firth in a fog. The presence of a certain species of seabird on a particular stretch of coast; the colour of the water; the setting-in or cessation of a groundswell; a tide-race, or even an eddy—such signs might give the thoroughly skilled and observant coasting or fishing skipper a tolerably good notion of his position. When one hears of the marvellous feats of navigation that are sometimes performed in thick weather by the skippers of Thames barges and other coastal craft, it will be generally found on further enquiry, that what has been attributed solely to dead reckoning was in reality the result of a timely cast of the lead or the cautious use of the kind of adventitious aids previously mentioned.[1]

Such knowledge and skill formed part of the mental equipment of many an experienced deep-waterman down to the last decades of sail, as may be seen from the journals and reminiscences of those times. When Captain Rex Clements first went to sea as an apprentice in the barque *Arethusa* he served under an old master who was a typical specimen of a class of navigator which has now vanished from the seas.[2] Captain Learmont has related in

1 Some interesting cases of this kind of local knowledge were communicated to the present writers by Captain Svensson. Scandinavian seamen, writes Svensson, have an eye to the various bird colonies, up and down the coast, away from which the birds fly in the morning and towards which they return in the evening. 'Seamen in hazy weather know that when the birds fly to the northward in the evening they were south of Stora Karslö (off Gotland); and when to the south-east they were north of the island.'... 'In a south-westerly gale there will be a nasty cross-sea off the southern coast of Scania, the sea rebounding from the shore: but as soon as the Sand-hammaren is abeam the sea will run true north-east.'... 'A ship I know of was steering south through Åland's Haf on a wild night in October 1910. Her old sailmaker was born in the north part of the Stockholm archipelago and knew every stone and every drop of water in Åland's Haf. He told the mate that the ship would not get through on the course she was steering. The mate told the master, and in the end the old sailmaker was called aft to con the ship. How he did it nobody really understood, as they sighted nothing; but the ship got through. Another vessel, the *Bardowie*, was lost that very night in the same waters, the two ships having been in company on the day before.'

2 'Frequently in the dog watch the old man called one or other of us up on the poop and talked to us about our profession and duties. On such occasions he always used to emphasize the importance of learning to know the face of the sky and sea and studying the ways of birds and fishes. He himself was no great reader, but his knowledge of winds, weather and natural history was truly wonderful. He navigated the ship more, I verily believe, by the look of the sea, the flight of birds, the appearance of clouds and a certain indefinable sixth sense emanating from his vast knowledge

his memoirs how he once found the penguin colony in the West Falklands group a useful aid to navigation.[1] Similarly, early in the present century Norwegian vessels approaching Bear Island in a fog would look out for a certain species of seabird, since when these birds 'got up from the sea we knew for certain that they would make for the bird rock on the western side of the mouth of the harbour'. Norwegian fishermen would frequently use the flight-line of certain seabirds for locating the Faeroe Islands and Jan Mayen in thick weather. During the last war Mr (now Sir) E. M. Nicholson, travelling to America in one of the 'Queens', is recorded to have astonished her master by calculating their approximate northing from the relative frequency of the dark form of the fulmar to be seen in the vicinity.[2] Knowledge of such signs and portents as these, indeed, must have corrected the dead reckoning of countless mariners in all ages, and saved many a good ship from imminent disaster.

Throughout the final decades of the nineteenth century Captain S. T. Lecky—an authority of immense knowledge and experience—continued to pour scorn on the theory of regular ocean passages made solely by dead reckoning in successive editions of *Wrinkles in Practical Navigation*.

We often hear stories of marvellous exactness with which the dead reckoning has been verified by the result. A man has steamed or sailed across the Atlantic without having got a glimpse of sun or stars the whole way, and has made land within five miles of the place aimed at. This may be done once, and may be done again, but must not be trusted to on any one occasion as probably to be done again this time. All over the surface of the sea there are currents of unknown strength and direction. Regarding these currents, much most valuable information has been collected by our Board of Trade and Admiralty, and published by the Admiralty in its 'Atlas of Wind and Current Charts'. These charts show, in scarcely any part of the ocean, less than ten miles of surface current for twenty-four hours, and they show as much as forty to fifty miles in many places. Unless these currents are taken into account, then, the place of a ship, by dead reckoning, may be wrong by from ten to fifty miles per twenty-four hours; and the most accurate information which we yet have regarding them is, at best, only approximate. There are, in fact, certain currents, of ten miles and upwards per day, due to wind (it may be wind in a distant part of the ocean) which the navigator cannot possibly know at the time he is affected by them. I believe it would be unsafe to say that, even if the steerage and the speed through the water were reckoned with absolute accuracy in the 'account', the ship's place could in general be reasonably trusted to within fifteen or twenty miles per twenty-four hours of dead reckoning. And, besides, neither

of all these, than by the more orthodox method of scientific instruments. I never grasped half of what he told me about such things as the movements of upper and lower clouds and the behaviour of birds.... He did not adhere strictly to the books, but gave us methods of his own. His navigational formulae were rough and ready and the meticulous accuracy of the text-books he did not approve of, but no man who every put pen to paper could teach him anything about seamanship and the incommunicable wisdom that only long experience of the sea can give.' (Rex Clements, *A Gypsy of the Horn* (1924), pp. 49, 198.)

1 J. S. Learmont, *A Master in Sail* (1950), p. 56.

2 See Marcus in *Speculum*, Vol. xxx, p. 604 *n*.

the speed through the water, nor the steerage, can be safely reckoned, without allowing a considerable margin for error.[1]

Captain Lecky finally summed up his opinion of all such claims in a single withering sentence:

Transatlantic passages made solely by dead reckoning!!!!![2]

There exists no certain, conclusive evidence of regular ocean passages made solely by dead reckoning in the Viking age, in the era of the great geographical discoveries, or in any other era. A highly skilled and careful navigator might, with the aid of luck, bring his vessel safely across the ocean working solely on dead reckoning. But with all his skill and with all his care chance, and not skill, was still the determining factor. To vindicate the new dead-reckoning theory—in the face of the best professional judgement and experience—it would be necessary to prove the case up to the hilt. Up to the present, no evidence likely to convince a seaman has been forthcoming. Above all, it should never be lost sight of that, in any difference of opinion as to what is and what is not possible at sea, the seaman and not the scholar (however erudite) must always be the ultimate authority. All too frequently the contribution made by the *savant* in his study to these essentially practical problems of seamanship and navigation is really little more than an academic exercise. In which connexion the finding of a certain bygone Wreck Enquiry might well be borne in mind. To quote the *Nautical Magazine*: 'It is not long ago that at an enquiry into the loss of a large sailing vessel by stranding on our south coast, the Court found that the master (who, if we mistake not, held an extra certificate) "was too much of a student and too little of a sailor—i.e. the acquired knowledge was there, but the training had been imperfect".'[3] The balance of the documentary evidence, *taken in conjunction with the overwhelming consensus of professional opinion*, would, in short, appear to be in the highest degree unfavourable to any theory of regular ocean voyages made solely by dead reckoning.

1 S. T. Lecky, *Wrinkles in Practical Navigation* (ed. 1914), pp. 183–4.

2 Lecky probably had in mind such noted apologists for dead reckoning as the late Captain Purdy: see *Nautical Magazine*, Vol. LXXI (1902), p. 389.

3 *Ibid.*, Vol. LX, p. 414.

THE TRANSITION FROM PADDLE-WHEEL TO SCREW PROPELLER

By Professor G. S. Graham

I

FOR more than three hundred years, the sailing vessel had changed but slightly in design of hull, or in the construction and arrangement of spars, rigging and sails. By the end of the Napoleonic Wars, advancing techniques in industry had made little impression on British marine architecture, either military or mercantile. Although some of the criticism of British models and methods may have been captious,[1] it is not unjust to say that the bane of British shipbuilding and ship-management in the eighteenth century had been an obstinate opposition to innovation, combined with a contempt for scientific learning, and a blind faith in 'practical experience' usually expressed in a popular 'rule of thumb' philosophy. While the French encouraged and availed themselves of the highest mathematical and architectural talent, British shipbuilders tended to spurn the applications of theory, cribbing and copying from friend or foe what they saw and liked. Not until 1806, as a result of the Barham Commissioners' report, did the government begin to consider the advantages of organizing a system of professional education for talented shipwright apprentices. In 1811 a school of naval architecture was finally established, and brought into operation in January of the following year.[2]

1 Gabriel Snodgrass, a working shipwright who had been appointed Surveyor to the East India Company in 1757, contended that 'a great deal too much has been said in favour of French ships. I cannot, myself, see anything worthy of being copied from them but their magnitude'. (Letter from Gabriel Snodgrass, Esq. to the Right Honorable Henry Dundas, President of the Board of Commissioners for the Affairs of India, one of His Majesty's principal Secretaries of State, etc., etc., and to the Hon. the Chairman, the Deputy Chairman, and Court of Directors of the East-India Company, on the mode of improving the Navy of Great Britain: to which is added an Appendix. Printed by order of the Hon. Court of Directors, 1797, p. 10.) Admittedly, there has always been a persistent tendency to over-estimate the quality of an enemy's or rival's ships and armament. The French were almost equally prone to emphasize the superiority of such English ships as they were able to capture and adopt. On the other hand, Snodgrass was forced to admit the 'very extraordinary' fact that several line-of-battle ships and large frigates were being built by government from drafts 'copied from those ridiculous ships'. Mr George Naish of the National Maritime Museum is inclined to agree with Snodgrass that the Admiralty had no need of French models, and he tells me that he is fortified in his judgement by Howard I. Chapelle's hardening conviction that the Americans followed English rather than French designs. (For an earlier discussion on French influence, see Chapelle's *The History of American Sailing Ships*, 1935, pp. 78 *et seq.*)

2 John Fincham, *A History of Naval Architecture* (London, 1851), p. 176.

Although the school was intended to combine training in mathematical and mechanical sciences with courses of practical construction, there was no substantial theoretical knowledge on which to draw, and on the practical or experimental side the dockyard authorities proved to be reluctant teachers. More than thirty years were to elapse before any member or graduate of the institution was in a position to submit an original design for a man-of-war.[1] 'The study of ship form, with a view to analysing the forces under which sailing ships moved by wind through the water, and to discovering the laws which those forces obeyed, was still mainly an academic pastime of the Society for Improving Naval Architecture, and outside the province of the naval authorities.'[2]

During this time, the scientific advancement of shipbuilding was the concern of only a handful of specialists. An engineering industry in our sense of the words did not exist. Imaginative pioneers like Robert Seppings, William Froude or John Scott Russell (the real founder of the Institution of Naval Architects (1860)) could do little more, by teaching and experimental research, than lay the foundations for subsequent achievements.[3] Although Science had inevitably invaded the yards with the coming of iron and steam, most shipbuilders continued to regard with scarcely veiled hostility the attempt to substitute 'rule' for 'instinct'.[4]

Governments had been similarly slow to support new developments. The early technical advances in iron and steam were the work of private inventors

1 All the text-books were foreign, since none in English existed. None the less, under the headship of Dr Inman, a Cambridge mathematician, forty-one Admiralty students were graduated before the closing of the school by Sir James Graham in 1832. Not until 1848 did the Admiralty agree to the re-introduction of systematic theoretical training; and the new School of Mathematics and Naval Construction under the guidance of Dr Woolley, with only eight students, initiated in the course of its short five-years' existence a major reformation in merchant marine and naval design and construction. In 1860 the Institution of Naval Architects was founded, but not until 1864 was the teaching of the science of naval architecture resumed, when with Admiralty support, a College of naval architecture was established in South Kensington. In 1873 it was moved to Greenwich, and became an Admiralty school associated with the Royal Naval College, and after 1884 a 'feeder' to the newly formed Corps of Naval Constructors. See Sidney Pollard, 'The Economic History of British Shipbuilding, 1870–1914', a thesis submitted for the degree of Doctor of Philosophy in the University of London, 1951, pp. 107–15.

2 F. L. Robertson, *The Evolution of Naval Armament* (London, 1921) pp. 55–6. For an admirable survey of theoretical advances in naval architecture before 1877, see Sir William White's *Manual of Naval Architecture* (London, 1877) chap. xi, 'The Resistance of Ships'; chap. xii, 'Propulsion by Sails'. At the time of writing, White was instructor in naval architecture at the Royal Naval College.

3 None the less, Russell's study of the *Mechanism of Waves* (1834) influenced the design of four Royal Mail Company ships, and his work on iron hulls led to the introduction of longitudinal framing and cellular double bottoms. Moreover, it was Russell in alliance with Isambard Kingdom Brunel, who, in 1852, designed and built the *Great Eastern*, based on the latest scientific and mathematical knowledge. See Sir Nathaniel Barnaby, *Naval Development in the Century* (London, 1904), pp. 276–9.

4 See Pollard, *op. cit.* p. 106.

and merchant shipbuilders, with only occasional assistance from the Admiralty. In 1800, when Henry Bell approached the Admiralty with plans for steam navigation, the rebuff he suffered led him to publicize his experiments abroad to the ultimate profit of Robert Fulton in the United States.[1] Why was it, demanded Whitbread in the House of Commons in April 1815, that the new steam and hydraulic engines were still ignored by the Admiralty? He was astonished that 'the improvements which to a wonderful extent had been made in all the private concerns of the country, were so slow in finding their way into the public establishments, and especially the dockyards'.[2]

Not until 1812 did Bell complete his first steamer for regular passenger service in Britain,[3] establishing the Clyde as the future centre of steamship construction. Three years later, Lord Melville directed the Navy Board to experiment with a sloop built to carry a Bolton and Watt steam engine, but this trial was never carried out. In 1816, however, the First Lord was prepared to encourage the elder Brunel (Sir M. I.) in his plans for providing steam tugs. '. . . the Board deem it unnecessary', wrote Melville, 'to enter, at present, into the consideration of the question as to how far the power of the steam-engine may be made applicable to the general purposes of navigation; but as it would be attended with material advantage to his Majesty's service, if it could be used for the purpose of towing ships of war out of harbour, in the Thames or Medway, and at Portsmouth and Plymouth, when they would be prevented from sailing by contrary winds, desire him to submit his ideas on that part of the subject, if it appears to him to be practicable'.[4]

1 In 1800, 1803 and 1813, Bell unsuccessfully sought support for his inventions with the British Government. In 1803, after being informed that the Board of Admiralty were not interested, he forwarded 'an account of his method of propelling vessels against wind and tide, by the application of steam power' to most of the European governments, and also to the United States. (Bennett Woodcroft, *A Sketch of the Origin and Progress of Steam Navigation* (London, 1848), p. 82.)

Although the United States with some justification has laid claim to the honour of having first applied steam power to long-distance commercial navigation, the first steamer capable of practical, continuous service was the *Charlotte Dundas* built by William Symington in 1801–2. The engine which was built by Watt drove a stern wheel. In 1807 with information obtained by watching these experiments on the Forth and Clyde Canal, Fulton built the *Clermont* in a New York yard, and in the autumn of that year the *Clermont*, with a Boulton and Watt engine, steamed the 130 miles to Albany in thirty-two hours, and subsequently maintained a regular service. Within fifteen years, some three hundred steamers were being used on American lakes and rivers.

2 Parliamentary Debates, Vol. xxx, p. 809; quoted Elie Halévy, *A History of the English People, 1815* (London, 1924), p. 45.

3 The *Comet* of 25 tons had a 40-foot keel, 10½-foot beam, 3 horse-power and a speed of five miles an hour. (Porter, *Progress of the Nation*, Vol. II (ed. 1838), p. 44. B. Woodcroft, *op. cit.* p. 81.)

4 Sir John Barrow, *An Autobiographical Memoir of* (London, 1847), pp. 388–9.

According to the secretary of the Admiralty, John Barrow, 'from this period may be dated the introduction of steam-navigation into the English Navy'.[1] But for long the Admiralty were inexorably cautious, and Brunel continued to build self-navigating models at his own expense.[2] It was so important to the greatness and independence of the country, the Chancellor of the Exchequer, Nicholas Vansittart, warned Melville in 1820: 'to possess all the means of naval superiority in their highest perfection that I think it a great political object to attend to all the improvements of an invention which seems likely to be at least very formidable to our trade if not materially to affect the success of naval warfare.'

On the other hand, as he was careful to point out, it might be possible to obtain all the benefits of invention without the sweat and expense. Since the Americans had made such improvements in the application of steam to sailing vessels, 'it would be much more advisable to buy one of their best steam schooners as a model than to build in the first instance for ourselves'.[3] This statement goes far to explain Admiralty caution. The Treasury was shy of spending money, the more so if private or foreign enterprise could be counted on to take the risks and do the spade work.

None the less, the Admiralty did build their own ship. The *Comet*—238 tons with an engine of 80 horse-power—was launched at Deptford in 1822; and not only engines, but hull and paddle-wheels passed the hazardous tests of hard trials and subsequent service.[4] At last, steam had been accepted as an experimental instrument of British naval power.

1 *Ibid.*

2 See R. Beamish, *Memoir of the Life of Sir Marc Isambard Brunel* (London, 1862), pp. 142–3. Only in the thirties can it be said that government took the initiative in encouraging steam navigation, often by subsidizing mail steamers. Cf. C. E. Fayle, *History of the World's Shipping Industry* (London, 1933), p. 229.

3 Nicholas Vansittart to Melville, 31 July 1820; *Melville Papers*, Clements Library, Ann Arbor, Michigan, U.S.A. 'The slow progress which the naval service has made towards its present ameliorated state', wrote Lord Cochrane (subsequently Tenth Earl of Dundonald) in later and soberer years, '. . . has not permitted any one Board of Admiralty in my time to stand pre-eminently distinguished for decisive improvements. These have rather been effected by the gradual changes which time occasions, or by following the example of America, or even of France than by encouraging efforts of native genius. . . . This timidity as to change caused many years to elapse, after the commercial use of steam-vessels, before the naval department possessed even a tug-boat.' (Letter of 7 June 1842; in Thomas (Eleventh Earl of) Dundonald and H. R. Fox Bourne, *The Life of Thomas, Lord Cochrane, Tenth Earl of Dundonald*, Vol. II (London, 1869), pp. 229–30.)

4 The *Comet*, which the Navy fitted with four 9-pounders, had a boiler capable of raising steam pressure of about 3½ pounds, a long bell-mouthed chimney and a single-cylinder reciprocating engine pointing upwards and slowly turning a pair of unboxed paddle-wheels. The whole apparatus was hand-made in hammered iron, and provided a speed of four to five knots. (See G. A. Ballard, 'The Navy', in G. M. Young, ed. *Early Victorian England 1830–1865*, vol. I, London, 1934), pp. 305–6.)

Thenceforward, government played an active, if not exuberant, part in forwarding, or subsidizing, experiments with steam. That there were periods of fearful doubt and vacillation in the thirties is understandable. The very multiplicity of new ideas encouraged alternate waves of official optimism and lavish expenditure, followed by scepticism and pinch-penny frugality. The Admiralty was inundated with inventors' schemes and projects. The host of speculative inventors, wrote the First Lord, the Earl of Minto, in 1835, 'is not easy to satisfy or get rid of, especially when they happen to be naval officers of high rank, who may fancy themselves capable of making improvements in naval construction, principally in steamers, of which they can have but a very imperfect knowledge'.[1] Palmerston confessed to Lord Durham that in a moment of exasperation he had told the Russian naval attaché '(that which is true) that till very lately we have been the worst and most unscientific shipbuilders in the world; and that the French, Spanish and American ships are all better sailers than ours; and that, moreover, during the war, when we took good sailers from the French and Spaniards, we seldom failed to spoil their speed by what we called improvements'.[2] 'Any one who enquires into the matter', wrote W. S. Lindsay somewhat bitterly in 1852,

> will find, that, for many years, a very large portion of the sum annually voted for the navy has been expended in experimenting on the various ships in the dockyards, during the course of their construction, by the various Lords of the Admiralty, superintendents, and master-shipwrights; that an equally large amount has been spent after they were built, either in lengthening them, or in rounding or flattening their sterns, and, too often, in all but rebuilding them. He will further find steam frigates built too small to carry the engines made for them; or engines made too powerless to propel the frigates built for them. If he even does not go to a greater expense than a trip to Woolwich and Sheerness, he may find, as he sails down the river, stupendous steam-boats built of iron, by the order of the one set of Admiralty lords, and without having been used, being broken up for sale as old metal by order of their successors in office, or used as depot hulks for coals; and he will find at Woolwich and Sheerness a great many things which were never used, and never can be used....[3]

II

The tedious and repetitious lag between invention and general adoption is particularly evident in the slow transition from the paddle-wheel to the screw propeller. When John Ericsson in May of 1837 took the First Lord of the Admiralty, the Surveyor, the Hydrographer and other notables on a trip

1 E. C. Smith, *A Short History of Naval and Marine Engineering* (Cambridge, 1838), p. 84; see also, E. Miles, *An Epitome, Historical and Statistical, Descriptive of the Royal Naval Service of England* (London, 1844), p. 35.

2 Letter of 8 April 1836; Broadlands Papers. I am indebted to Professor Sir Charles Webster for this quotation.

3 *Our Navigation and Mercantile Marine Laws* (London, 1852), p. 78.

down the Thames at the average speed, under screw propulsion, of ten miles an hour, he was, in his *naïveté*, surprised to find his achievement contemptuously ignored.[1] Such mulish inertia is comprehensible only when it is realized how much money and effort had already been expended on the paddlewheeler,[2] and how much more would have to be forthcoming before three complex instruments—hull, engine and underwater screw—could be combined to produce an efficient and economical ship-of-war. An effective solution was bound to depend on theoretical attainments and machine skills, which did not exist at the beginning of the century, and could hardly be said to exist outside the industrial field ashore before the fifties. The evolving marine engine, as a shrewd seaman, Captain Halsted, put it in 1850, forced engineers to set aside and replace 'plans, patterns and patents alike'. 'It has put masters and men to work again upon initiatory labours mental and physical, with past principles, more than past practice, for their guide.—And it has consigned to the risks of a fresh struggle upon a new field, the maintenance of hard-earned and long-established reputations.'[3]

The Admiralty wanted an efficient sea-going man-of-war; the steam paddle-wheeler had not made good in this capacity. Although rapidly becoming indispensable to the Royal Navy as a tug,[4] it remained subject to great limitations as a fighting ship. Not only were the paddles extremely vulnerable to damage by sea and shot, they restricted the arc of fire, and took up considerable space ordinarily given to armament. Moreover, all the efforts of the architect could not prevent miscalculation in capacity and immersion. A badly proportioned ship often meant, especially at slow speed, that the paddle-wheel was too deeply immersed, and wasted power in churning the water. Not till 1829, were ways found of automatically feathering the paddles as they entered, passed through and emerged from

1 See William C. Church, *The Life of John Ericsson*, 2 vols. (London, 1890), Vol. 1, pp. 89–91.

2 'I have really much doubt whether we ought not to go further with the fitting of Paddles...', wrote Admiral Cockburn to John Wilson Croker in 1830, in the course of advising the second secretary of the Amiralty to go aboard Captain Napier's 42-gun frigate *Galatea* at Spithead, and inspect the paddle machinery. 'Your opinion upon it', he went on, 'would be most useful to us in helping us to some ultimate decision upon it—and Napier would be delighted to shew off his hobby to you'. (12 September 1830; Cockburn-Croker Correspondence, in the Clements Library, Ann Arbor, Michigan.) Croker visited the ship on 14 September (see Sir Henry Keppel, *A Sailor's Life under Four Sovereigns*, 3 vols. (London, 1899) Vol. 1, p. 105). Napier's experiments were conducted by means of winches set up on each side, and along the whole length of the main deck. To set the paddles in motion two-thirds of the ship's company were required to man the winches. (H. N. Williams, *The Life and Letters of Admiral Sir Charles Napier* (London, 1917), p. 66.)

3 E. P. Halstead, *The Screw Fleet of the Navy* (London, 1850), pp. 6–7.

4 It was announced only recently (1955) that the Admiralty had ordered the building of several paddle-tugboats for use in congested or restricted harbours such as Portsmouth.

the water, by making them movable about their horizontal axes, thus increasing speed and reducing vibration.[1]

The chief motives which led eventually to costly experiments with the screw lay partly in positive attractions, viz. the need to restore the warship's complete broadside armament, and the possibility of placing vital machinery below water-level, but above all else in the prospect of employing above decks full sail power and working the vessel as the traditional sailing ship until the steamer was sufficiently developed to be efficient.

The Admiralty were reluctant to go 'all out' for the screw steamer, until they had complete confidence it would work. *Economy*—it can hardly be repeated too often—was a fundamental principle of nineteenth-century government, and fear of innovation in the nineteenth century was basically fear of spending public money, or of being vulnerable to the charge of wasting public money. The retention of *full sail power* was the key most likely to open the hearts and money chests of the Treasury. 'The whole question of Economy', wrote Captain Halsted in 1849, 'resolves itself into our being able usefully to employ Sail-power as "the rule", and resort to Steam-power as "the exception"; and whatever may be the improved Efficiency in armament secured by the adoption of the Screw, Economy alone will determine whether it can or cannot supply an improved System for the more General and extended employment of Steam in Naval services.' Halsted believed that the 'practical value' of a screw fleet was to be worked out of its 'canvas' rather than its 'coals'.[2]

Such remained the predominant naval view well into the fifties. Admiralty policy aimed at maintaining intact the line-of-battle ship, frigate, corvette and sloop with such steam power as would enable them to manœuvre in battle as well as make way in calms. Against strong head-winds, it was assumed that the screw, in contrast to the paddle-wheel, was powerless;[3] on the other hand, with favouring winds, the screw unlike the paddle-wheel could with some effort be lifted out of the water so as not to impede the ship's progress under sail. (Not till 1861 did the Admiralty abolish the 'lifting screw' in all ironclads under construction.) According to the detailed Admiralty report of 1849, based on an analysis of thirty-three trials, the screw was 'a much less cumbersome instrument' than the paddle-

1 See General Sir Howard Douglas, *On Naval Warfare with Steam* (London, 1858), p. 40; C. N. Nixon, *Observations on Steam Ships and the Use of Iron, etc.* (London, 1847), p. 10; also, James Peake, *Rudiments of Naval Architecture; or an Exposition of the Practical Principles of the Science in its Application to Naval Construction* (London, 1851), p. 144.

2 *The Screw Fleet of the Navy* (London, 1850), p. 47.

3 See Vice-Admiral P. H. Colomb, *Memoirs of Admiral The Right Honble Sir Astley Cooper Key* (London, 1898), p. 228; and John Bourne, *A Catechism of the Steam Engine*, 4th ed. (London, 1856), p. 405.

wheel, and interfered less with 'nautical arrangements'. As a completely equipped sailing ship, the auxiliary screw steamer should be able to 'perform all the ordinary steam service of the present paddle-steamer, at the same mean speed, without employing any steam power at all'.[1]

There were, of course, a few visionaries, who argued even in the forties, the superiority of steam *per se*. While it was generally accepted that ships should be able to sail well in case of mechanical break-downs or shortage of coal, a bold controversialist could argue that 'their *steaming* qualities ought to be superior to their *sailing*, or they are no longer worthy of the name of steamers, and until this axiom is established adieu to all improvements'.[2] Ten years later, John Bourne raised the same question by asking rhetorically whether the screw propeller was best adapted to full power or use as an auxiliary.[3] He gave his answer without reserve: '. . . the legitimate sphere of the screw is in propelling vessels with auxiliary power'. 'A small steam power', he contended:

> acts very advantageously in aid of sails, for not only does the operation of the sails in reducing the resistance of the hull virtually increase the screw's diameter, but the screw, by reducing the resistance which has to be overcome by the sails and by increasing the speed of the vessel, enables the sails to act with greater efficiency, as the wind will not rebound from them with as great a velocity as it would otherwise do, and a larger proportion of the power of the wind will also be used up. In the case of beam winds, moreover, the action of the screw, by the larger advance it gives to the vessel, will enable the sails to intercept a larger column of wind in a given time. It appears, therefore, that the sails add to the efficiency of the screw, and that the screw also adds to the efficiency of the sails.

The controversy over the screw was part and parcel of what has been romantically called the struggle between sail and steam. The fact that the majority in the Admiralty as well as in the Service afloat saw steam as an auxiliary aid and convenience to traditional sail helped to accelerate experiments with the propeller, but inevitably slowed up the evolution of the complete screw steamer. For safety's sake architects were concentrating on a marine hermaphrodite that still possessed the traditional lines and hull of the true sailing ship. Consciously or unconsciously, the advocates of the screw were pressing for a steam instrument that seemed to offer a new life

1 See General Report upon the trials between H.M. ships *Basilisk* and *Niger*, Captain E. P. Halsted to Secretary of Admiralty, 1 October 1849; Public Record Office, Admiralty 7, vol. 617, Case 132. Although it was accepted before the Crimean War that steam would have a fundamental effect on warfare especially in narrow seas, the steam vessel was regarded even after the Crimean War as an 'auxiliary' rather than a 'principal' in any scheme of naval manœuvre. See, for example, the views of Captain Bowles, *Remarks on the Conduct of the Naval Administration of Great Britain since 1815*, 3rd ed. (London, 1847), p. 8.

2 C. N. Nixon, *Observations on Steam Ships*, pp. 8–9.

3 *A Catechism of the Steam Engine*, 4th ed. p. 407.

to sail propulsion.[1] The official and the popular objective was to maintain the sail power of the so-called screw steamer complete; the ship of war, with an auxiliary low-pressure engine was required at least to equal with sails alone the speed of the pure sailing ship it was intended to supersede. In short, the steamer with a screw propeller was still presumed to be a complete sailing ship. Anything added to it in its role as a steamer was considered as accessory; the addition of a screw was in no way intended to reduce its status as a sailer.

The painful process of adapting the screw to the sailing ship continued throughout the forties and fifties; it was the beginning of a seemingly endless effort to reconcile evolving scientific theory with practice. Once again, the delays and doubts that accompanied the 'screw versus paddle' controversy, and that were celebrated by a series of tugs-of-war between screw-propelled vessels and paddle-wheelers of the Royal Navy were not the consequence of anything so simple as Admiralty conservatism and prejudice. There was undoubtedly a preference for practical experience over scientific theory; but, apart from a few hidebound professionals, resistance to revolution was not opposition to innovation as such. The Admiralty wanted improvements; French rivalry, if nothing else, forced their hands. They wanted an efficient, sea-going man-of-war, but until the defects of the early screw steamer were remedied, they simply could not afford to jettison the sailing ship, that was built primarily for sailing and *not* for steaming. Indeed, a whole series of agonizing and exacting trials were necessary before the efficiency of the screw was fully established as an auxiliary to sail.[2] Not until 1849, for example, was it proven to the satisfaction of their Lordships that even in rough weather the screw possessed the enormous advantage of uniform immersion and action; in other words, while paddles were least effective in 'deep immersion' and most effective at 'light', the screw remained equally effective from 'deep' to 'light', and was less affected by listing or heeling over.[3]

Meanwhile, in 1844 Isambard Brunel's *Great Britain* had made her first trial trip from Bristol to London—the first successful application of the screw to a vessel of large burden. After that, it was only a question of time and tinkering before its adaptation as an auxiliary to the warship. In

1 See Colomb, *Memoirs of Cooper Key*, p. 225.

2 By 1840, satisfactory unofficial tests with packets, and finally the successful trials of the *Archimedes* (232 tons and 80 horse-power) jolted even the more stiff-necked of the Admiralty into approval and action. Between 1842 and 1845 the experimental screw-sloop *Rattler* showed herself by trials (which included a tug-of-war with the paddlewheeler *Alecto*) a handier and more efficient ship than a paddle sloop of similar size, lines and power.

3 General Report upon the trials between H.M. Ships *Basilisk* and *Niger*, *loc. cit.* For further analysis of evidence, see Report of the House of Commons, 1851, p. 565.

January 1846 the *Amphion* (93 tons, new measurement) was converted on the stocks, and launched as the first of the screw frigates. 'Every part of her, and all her fittings except the engines, boilers, and screw, was the same as in an ordinary sailing frigate.... She had direct-acting engines on the plan of Count de Rosen, of 300 nominal horse-power; and it was remarked of her, when she was launched, that she was the first war steamer built in this country which had the whole of her machinery and boilers below water and therefore secure from the enemy's shot.'[1] Her screw was probably based on the Ericsson model, and when Captain Cooper Key took command of her in 1853 her best steaming time was only a little over five knots. None the less, the Admiralty was now prepared to adapt the screw to the line-of-battleship. Despite protests and demands for further investigations,[2] H.M.S. *Agamemnon* was launched in 1852. Amid gales of hurricane intensity, her Captain (later Admiral Sir W. R. Mends) was able to 'trust much to good anchor and cable, good screw and steam to help her through very much bad weather'. 'The dear old screw is slowly working away to ease our cable', he wrote in 1855 off Sebastopol, 'and affords us much comfort.'[3]

III

But Mends's ship was a sailing ship, and as long as ships-of-war were made for sail and built of wood the screw was bound to remain auxiliary to sail, because the shape of the hull, especially the stern, was still adapted to sail propulsion. In other words, once the screw had been finally adjusted to the engines as in Mends's ship, the main difficulty in the way of effective steam propulsion became not so much mechanical as structural.

Notwithstanding improvements in naval construction during the forties, the sterns of wooden ships were still their weakest parts, and most warships were built of wood. For one thing, the stern was not entirely water-borne; its upper section overhung the water, and for that reason was weaker structurally than the bows. Moreover, the under-water section of the after-hull was not designed for effective propeller thrust, and the avoidance of slip. This was true of most of the early warships that were converted to screw before and during the Crimean War. Until the screw had proved itself sufficiently efficient to be considered the principal method of propulsion, the Admiralty refused to make adjustments in the hull that would spoil the ship for sailing.

1 Colomb, *Memoirs of Cooper Key*, footnote, p. 221. See also Geoffrey Penn, *Up Funnel, Down Screw, The Story of the Naval Engineer* (London, 1955), p. 50.

2 See J. C. Hoseason, *The Steam Navy: and the Application of Screw Propellers to Sea-going Line of Battle Ships* (London, 1853), pp. 7–8, 19, 49.

3 B. S. Mends, *Life of Admiral Sir W. R. Mends* (London, 1899), pp. 232, 244–5.

In addition, the screw itself had to be perfected in terms of length, shape and pitch, and this took time. In its original form, it consisted of a very strong metallic plate, standing edgewise on a cylinder or shaft, and winding around it like the blade of an augur. Sometimes there were two or more blades making up the spiral. This instrument was fixed on the end of the shaft projecting from the stern, and space for the turning of the blades was allowed by a vertical oblong recess cut out of the keel and stern immediately before the rudder. At first the screw was cast solid, and consequently the pitch or angle at which the blades were set was fixed in the casting. Since the discovery of the proper pitch required constant experiment, the enormous expense involved in casting a fresh screw for every experiment may be imagined.[1] Not until William Froude with Admiralty support built his experimental tank in 1867 was the problem of water resistance studied with scientific thoroughness and economy.[2]

Finally, the adoption of the screw in place of the paddle-wheel meant that increased speed had to be given to the engines, and this evolutionary transition depended upon the conquest of friction and vibration. Whereas the paddle-wheel with side levers and connecting rods could be driven by a slow-working engine, the screw in order to provide comparable propulsion had to turn with great rapidity.[3] This necessitated either a fast engine with direct action through a piston fixed by connecting rods on the crank shaft, as in the modern automobile, or the normal slow engine acting through geared wheels, as originally designed for the paddle-wheel, and used on the *Rattler* and other experimental screw ships. Both were subject to repeated trials by various firms under contract to the Admiralty between 1840 and 1855, and eventually victory went to the vertical engine, straddling the shaft and working fast with a direct drive. Admittedly, the gearing for indirect drive did permit slow speed of piston with high speed of shaft and screw, but the gear wheels were cumbrous, and their wooden teeth were

1 Colomb, *Cooper Key*, *op. cit.* p. 307.

2 Froude (1810–79) became Vice-President of the Institution of Naval Architects. A brief biography taken from the *Transactions of the Institution of Naval Architects*, Vol. xx, is contained in Barnaby, *Naval Development of the Century*, pp. 287–94. A leading article on Froude in *The Engineer* of 13 July 1934 contains the following speculation: 'We suppose no useful estimate of the economy which has resulted from tank testing can ever be made, but it may at any rate be said that it would have to be made in millions of pounds sterling, no lesser unit being adequate for the magnitude of the computation.' (Quoted in Engineer Captain E. C. Smith, *A Short History*, *op. cit.* p. 357.)

3 See John Bourne, *A Treatise on the Steam-Engine*, 10th ed. (London, 1872), p. 803; also, his *Catechism of the Steam Engine*, 4th ed. (London, 1856), pp. 75–80; and *Treatise on the Screw Propeller* (London, 1867). For a simple account, with diagrams of the side-lever engine and the system of gearing for screw engines, see Arthur J. Maginnis, *The Atlantic Ferry, Its Ships, Men and Working* (London, 1892), pp. 175–8.

liable to be stripped or broken by such sudden interruptions as smashing seas.

The rapid wear and tear on stern shaft and propeller bearings was another problem. A durable underwater stern-bearing had to be found capable of withstanding the friction of the revolving shaft and propeller. Until that time, engines were frequently out of business for long periods, and occasionally the life of the ship was in danger. In 1855 the *Royal Albert* on her way from the Black Sea to Malta was beached on an Aegean Island as a consequence of rapid wear through propeller friction which allowed water to pour into the ship through the stern gland.[1] Not long after this incident, however, the introduction of *lignum vitae* made possible the manufacture of more durable stern-tubes and bearings, one of the first ships so fitted being the *Himalaya*.[2]

But *lignum vitae* was only a partial answer. The master key to the efficient screw warship was iron which had, at its best, the tensile strength to resist violent and continuous vibration. For long and hard-driving ocean voyages the screw propeller needed an iron hull, and the development of the large iron hull was slow. In 1864 Scott Russelll declared at the Institution of Naval Architects that 'bits of wood kept together with bits of metal cannot stand the continuous day-after-day wear and tear of the wriggle of a 1000 horse-power screw in the tail of a ship'. Another eminent member of the same Institution, John Grantham, remarked in 1865: 'as long as you have a ship planked, as wooden or composite ships must be, they will be shaken by the excessive action of the screw. We know that Government, with all their appliances, have never yet been able to overcome this difficulty, and that when they have tried to work on wooden ships to their full power, they have frequently been obliged to stop the engines, owing to the excessive shaking in the afterpart of the vessel; and the result has been most serious.'[3]

Moreover, iron was a stubborn metal, especially in the hands of a craftsman who had been trained to handle timber. The iron shipbuilder, unlike the trained shipwright, had to learn not only how to test and work iron, but how to use some mathematics and apply theories of naval architecture—to be, in short, a civil engineer. Such a class had not yet matured, and most of those in the vanguard who had mastered iron construction were busy

1 *Ibid.* pp. 305–10.

2 The *Himalaya* was built at Blackwall in 1853—340 ft. long, 46 ft. wide, and with a displacement of 4690 tons. She had a single-screw 18 ft. in diameter. As H.M.S. *Himalaya* she served throughout the latter part of the Crimean War as a naval transport, eventually ending her days as a coal hulk.

3 Quoted in C. F. T. Young, *The Fouling and Corrosion of Iron Ships* (London, 1867), p. 8.

building bridges and railways.[1] The rolling of iron plates to a uniform thickness was still a matter involving considerable working costs, and one requiring the utmost in skill and patience. Binding the frames and riveting the plates were still difficult processes.[2] Moreover, the quality of metal used in the earlier iron ships was poor, and this undoubtedly retarded the progress of the iron ship. A steady stream of complaints from shipbuilders on the uneven quality of the plates seemed to confirm the Admiralty's earlier suspicion of iron as dubious material for building warships.[3]

Chiefly then because of the certainty of rapid fouling, the varying qualities of the material, and in addition (consequent on enemy action) the fear of splintering and the practical difficulty of plugging jagged shot or shell holes, the first large iron-hulled and iron-armoured fighting ship—the frigate *Warrior*—was not launched until December 1860.[4] She was half

1 See Pollard, *op. cit.* p. 32. According to Engineer Captain E. C. Smith, 'Iron ship-building owed nothing to official encouragement, and its rise was entirely due to private enterprise'. (*Short History*, p. 95.)

2 In the beginning, iron ships were built in the same way as wooden ones; indeed, frames were often fitted together and spliced like frame timbers, with the ribs built upwards, instead of longitudinally to provide girder-strength. Gradually as the principles of iron ship construction became better understood considerable savings in weight of hull were effected even in the ironclad along with an increase in structural strength. In merchant ships the change from wood to iron meant a saving of from 30 to 40 per cent. See W. H. White, *A Manual of Naval Architecture*, *op. cit.* pp. 326–9, 369–70.

3 In 1863 the Controller of the Navy in a published statement on the comparative advantages of wood and iron in the construction of ships, remarked on 'the extreme uncertainty as to the quality of the material used, in fact, the small quantity of real good iron of the best ship-building qualities that can be found in the market.' C. F. T. Young, *The Fouling and Corrosion of Iron Ships*, p. 16. See also Pollard, *op. cit.* p. 38.

4 As early as 1842 General Sir Howard Douglas was consulted by Sir Robert Peel, as to the 'use and efficiency of a certain half-dozen iron frigates, two of which were finished and four constructing by contract'. Douglas replied that 'vessels wholly constructed of iron were utterly unfit for all the purposes of war, whether armed or as transports for the conveyance of troops. I stated that a shot striking with great velocity would drive into the ship numerous splinters of the disk struck—that shot striking with reduced velocity, as when fired from a distance, would make large jagged holes that could not be plugged from the inside....' According to Douglas, he afterwards accompanied Admiral Sir George Cockburn to Woolwich to watch some experiments. Subsequently, he reported to Peel, and exhibited some of the fragments and splinters. In Douglas's opinion, the report plus the evidence put an end to the construction of iron vessels at that time. (*Postscript—Iron Defences*, 2nd ed., London, 1861, p. 5.) The Douglas view was widely shared in Admiralty circles, and the proponents of iron were for long regarded, in the words of the former Admiralty secretary, Sir John Barrow, as 'a dangerous set of projectors....' (Autobiography, p. 445.) In 1861 Scott Russell, in a pungent and conclusive answer to Douglas's *Postscript*, remarked that if the iron warship had been introduced at the time when Douglas 'sedulously and systematically opposed their introduction', the money spent on a semi-obsolete fleet 'would already have given to England a fleet more powerful than the combined navies of the world', and with an enormous saving in naval expenditure. (*The Fleet of the Future, Iron or Wood* (London, 1861), p. 6.) Douglas was reluctantly 'converted' to the ironclad in 1861. (See J. P. Baxter 3rd, *The Introduction of the Ironclad Warship* (Cambridge, Mass., 1933), pp. 168–9.)

as large again as the largest three-decker—of nearly 10,000 tons displacement—and her screw was driven by engines of 5470 indicated horsepower. The launching of the iron *Warrior* marked the beginnings of the modern British screw fleet.

But the transition over the watershed of 1860 was not rapid; in 1850 the proportion of iron to wooden ships was only about one to five—19,500 tons as against 99,000; by 1860 with a growing awareness of the weaknesses of iron, it had fallen to less than one to ten—34,800 tons iron as against 386,000 wood; by 1870, however, the number of iron ships had nearly quadrupled—130,200 tons as compared with 386,000 tons wood, and by the time Sir William White was publishing his *Manual* the wooden ship-of-the-line had been completely superseded.[1] *Cyclops* (1871), *Devastation* (1873), *Dreadnought* (1875) and *Thunderer* (1877) were first fruits of a long evolutionary process—twin-screw ships without masts and sails. At long last steam had accommodated itself to the line-of-battle ship, 'leaving her in all respects perfect as before—her noble broadsides clear and unencumbered'.[2]

1 *Manual of Naval Architecture* (1877), pp. 364–5.
2 Anon., *A Standing Navy* (London, 1851), p. 101.

SOME BRIEF NOTES ON FISHING IN CHINA

By G. R. G. Worcester

THE origin of the art of fishing in China is, of course, lost in the mist of time. The legendary Emperor Fu Hsi, 2953 B.C., is supposed to have taught the people how to make nets and to catch fish. The Chinese have been fishermen for countless ages, and there are many allusions to topics connected with fish and fishing in the Chinese classics that carry the ancient history of the industry backwards into remote antiquity long before the dawn of western literature on the subject.

Fish are held in very high esteem in China. Because it never closes its eyes, the fish is held to be the symbol of watchfulness and 'cheerful immortality'. Its scales make it the embodiment of strength and courage, the belief that it always moves in pairs provides an emblem of connubial bliss, while its usual habit of swimming against the current supplies an attribute of perseverance. This respect for its undoubted virtues is not based entirely on aesthetic grounds, but chiefly on the circumstance that the Chinese are particularly fond of eating fish.

It may with truth be said that they consume nearly every living thing to be found in water. Cuttle fish, dried jelly fish, shark's fin and shark's stomach are among the most popular dishes. Sea slugs, dried or smoked and afterwards boiled with deers' sinews, are much sought after on account of their fine taste and invigorating qualities. Indeed, fish, fresh, smoked, dried or pickled, is second only to rice as the staple of Chinese daily food; and fishing has, for this reason, formed a prominent occupation of the people.

The modes of fishing and the implements used at the present day vary not at all from those of ancient times; and the simplicity of the former and the ingenious construction of the latter are as remarkable now as in the days gone by. Fish are speared, dug for with a spade, attracted by bells, sung to,[2] scraped for with a form of dredge, blown out of the water by dynamite, ensnared in every conceivable form of trap, frightened into nets by noise, decoyed to jump into boats, poisoned and finally dived for by trained otters

1 The plans in this article were made by the writer in China during 1948.

2 There is a strong conviction among Chinese fishermen that one can catch fish by singing to them. 'Fishes, though small, have very long ears' is an old Chinese proverb; and to this day fishermen often hang bells on their nets to attract the fish.

and cormorants. Nevertheless, in spite of this desire to obtain fish—perhaps because of it—the Government from time immemorial have protected fishing. De Thiersant[1] mentions the appointment, several centuries before the Christian era, of special officers to rule over and protect the industry, and asserts that a Board of Fisheries existed under the Chou Dynasty, 1122–255 B.C.

There are certain groups of fish in China which are inhabitants of fresh water. For this reason canals and creeks leading towards an estuary are always blocked, so that the salt or brackish water cannot impregnate the fresh-water canal or creek, which is designed as much for irrigating purposes as for navigation and fishing. There is often a difference of level between the waters of the canal and those of the estuary. When the canal is intended as a connecting navigational link, there is a stone sluice with a ramp, over which often quite large junks are dragged and then launched again on the other side.

In every stream or pool of water, no matter how small or unpromising, be it at sea-level or near the summit of the highest mountain, we may be sure to find fish; and, as a natural consequence, fishing is carried out on the sea and in rivers, lakes, irrigation canals, ditches, inundated paddy fields and swamps. The purpose of this article is to record one or more examples from some of these often unauspicious places, as indicative, rather than exhaustive, evidence of the shrewdness, skill and patience of the Chinese fisherman.

The sea-going fishing junk

It is exceedingly difficult to select one characteristic example from among the multitudinous sea-going junks and their infinite variety; but, as dried cuttle fish has won for the Chusans a well-established celebrity, perhaps the most typical craft of the Northern seaboard are the Ta Tui Ch'uan or Big Catching Boats, the Cuttle Fishers, the least known and certainly the most picturesque craft of the Chusan Archipelago (see Fig. 1).

According to the Chinese Customs Trade Returns the total catch for the year was worth from four to five million dollars in 1939, a time when dollars were money. There were then 440 boats engaged in this trade alone.

The boats remain at sea for an incredible length of time, sometimes as long as four months. Provisions are taken out to them, and the fish is brought in, by boats, known as Chênhai-Ch'uan,[2] of special construction, which are loaded with natural ice used for storage purposes to keep the fish fresh and in good condition. These vessels have their destination at

1 Dabry de Thiersant, *La Pisciculture et la Pêche en Chine* (Paris, 1872).

2 These boats are described in detail in *Junks and Sampans of the Yangtze*, p. 126.

Shanghai, whence the fish is shipped in ice to other places. They are also used to transport fish which is to be brine pickled or salted. The only difference is that the fish is packed in salt instead of ice. Consequently, ice-making and salt evaporation are very important ancillary industries. Ice

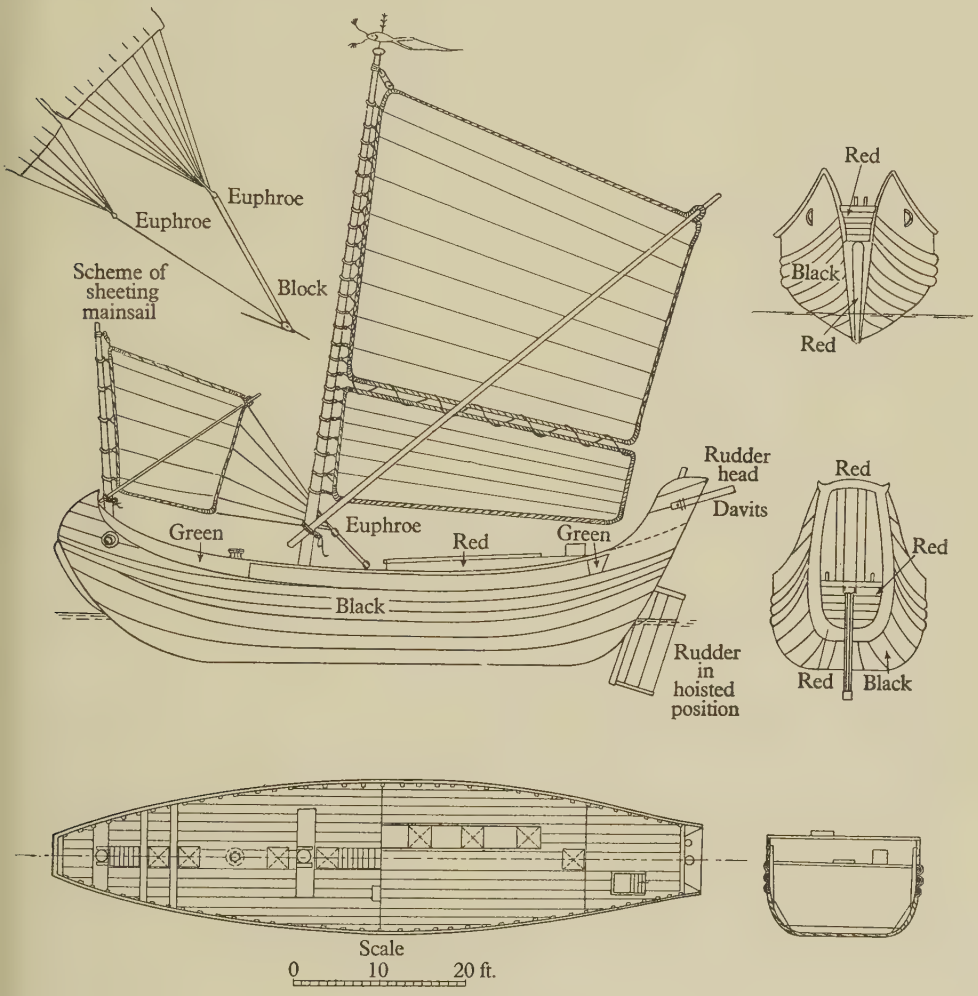


Fig. 1

houses in considerable numbers are situated on both banks of the Yung River near Ningpo. These are composed of four solid stone walls coated with mud. Upon these walls a high thick thatched roof is constructed with bamboo rafters. When the weather is cold enough, water is pumped into the rice fields which surround the structure; and the ice formed there is gathered and put into the ice houses, packed between layers of straw

matting. Here ice is stored during the hot weather. These houses are so effective in action that ice can be stored in them for three years.

Next in importance is the production of salt. All along the coast of Chekiang a primitive process of evaporating sea salt is carried out which is said to date from the time of the great Emperor Yü, who lived *c.* 2200 B.C. At high tide square basins formed of sand are filled with salt water, which, under the heat of the tropical sun, evaporates and leaves concentrated brine. Further evaporation is carried out in cast-iron pans over a wood fire.

Fishing is usually carried out during bad weather, for the junkmen say that at this time the water is cloudy, which fact reduces visibility; and the fish are less easily frightened. When, as is often the case, fishing is carried out at night, to attract the fish, dry wood is burnt in a wire basket on the end of a short pole.

In spite of their apparent clumsiness the junks in this trade are good sea boats and are built in water-tight compartments or rather in compartments meant to be water-tight. It is one of the strictest taboos that no women or children are allowed on board. The crew consists of fifteen men.

The smaller types of Chusan junks, in lieu of lug sails with battens, carry sprit-sails, usually with bonnets, half the size of the sail. The smaller types have a mainsail only, while the larger variety carry in addition a small sprit foresail.

The nets are all hand-made, by the fishermen themselves, from hemp string. From the raw hemp the fibres are peeled by means of the finger nails and the strips laid up on a primitive jenny. After being boiled in a concoction of mangrove bark, the nets are steeped in pigs' blood or wood oil, which will dye and preserve them. In the hot summer, nets are tanned twice during the month, but during the rest of the year once each month will suffice.

The junkmen work in clans; and, while they own the nets and gear, their junks are hired from middlemen, who require that they sell their catch only to them. The junkmen are the most conservative race in China; and so motorization of the junks, which began in Hong Kong in 1940 and is now such a feature of the craft of the South China fisheries, will not affect them for some time—if ever.

The fish which is to reach the market as dried material is shipped direct to the Saddle Islands, a group of rocky islands lying 30 miles east of the mouth of the Yangtze. During the months of April and May, and the first half of June, the islands are a scene of great activity. Here the fish are split, opened and spread out to dry upon the rocks in the bright strong sun, an operation which is concluded in a few days, when they are shipped to the mainland as P'u-Hsiang.

The men in the industry live in their boats or in temporary huts run up on the beach. At the end of the season in the 6th Moon the hundreds of junks and sampans, the men and, of course, the unbelievable host of flies, disappear as suddenly as they came.

The main base of the fishing fleet is in the picturesque land-locked harbour of Sing-ki-mun. This is said to be the second largest fishing port in the Far East and the fourth largest in the world.

In 1945 the United Nations became convinced that the Chinese, as a nation, were not eating enough fish. They considered, too, that their methods of fishing were out of date. Soon after, therefore, a number of experts came to China to investigate the industry in Shanghai. They found, to quote the American sponsored *Shanghai Evening Post*, that 'The Chinese paid little or no attention to the important work of fishing, which was carried out by the inhabitants of the various islands and provinces along the coast in small wooden craft', and went on to affirm that 'there were no big capital combines to handle the trade'. As a result of this a branch of U.N.R.R.A., known as The Chinese U.N.R.R.A., under American supervision, was set up in Shanghai. It was proposed to construct, in the first instance, a fleet of 200 of the most modern type of fishing craft, driven by 250 h.p. diesel engines, with auxiliary equipment of 35 h.p., each 75 ft. long with a beam of 18 ft., fitted with radar and every form of mechanical device, and to expend a sum of gold dollars 37,000,000 in a Fishing Rehabilitation Programme. During the summer of 1946 six of these craft arrived in Shanghai, having crossed the Pacific under their own power.

Although the large sum of money involved made an instant appeal to the Chinese officials for miles around, and many individuals of high and low degree secured lucrative office appointments, the scheme was boycotted from the first by the Chusan fishermen, who preferred to employ the craft and methods they have used from time immemorial. Although the Chusan fishermen are quite illiterate, most superstitious and the most conservative people in China, yet they had sufficient good sense to realize that this grandiose scheme would mean putting about a million men out of employment without achieving any very useful purpose.

Hand lining

Hand lining is usually confined to small craft working inshore. The lines are quite short, with one or a few baited hooks along their length. The ends of the line, which are made of China grass, are allowed to rest on the sea-bottom, where they are lead-weighted; or they may be trailed from a boat under sail. The fisherman usually holds a line in each hand.

The inshore fishermen of Kwangtung are usually Hakkas or Strangers. Where the group originated is a mystery, but they are supposed to have emigrated from Honan in the fourth and again in the ninth centuries. They are thought to have reached Kwangtung in the Ming Dynasty. The Hakkas have their own dialect and customs. The boat-women are easily distinguishable by their heavy ear-rings, flat hats or the coloured square of cotton material on their heads folded into a triangle and tied under the chin.

In April and May the Hoklos, a clan of water-gipsies, invade the South China fishing grounds from the Swatow littoral. They have connexions with the shops and fish dealers in Hong Kong. These fishermen are very quarrelsome and, when the season is bad, are noted for their raids on their more peaceful Cantonese colleagues. They live in mat sheds at convenient spots near good sandy beaches, where they pull up their boats at night. Officially they are hand-liners; but they are credited with being the chief exponents of the art of dynamiting fish, a labour-saving device which is illegal in Kwangtung and Hong Kong. In these operations they use a large kerosene lamp fitted with a mantle to attract the fish. Fish-spearing is another form of their activities. A typical inshore hand-liner is shown in Fig. 2.

The Chu P'ai or bamboo raft of Amoy[1]

The Chu P'ai or bamboo raft of Amoy is the counterpart of the dory of Newfoundland. The raft to be recorded here is carried by the Amoy Fisher, which has already been described in these pages (*M.M.*, Vol. xl, p. 304). This craft is probably the least known of the Chinese long liners. The junk itself is used as a parent ship; but instead of carrying out fishing operations from sampans, bamboo rafts are employed. Each parent ship carries twelve rafts, nested on the upper deck. They consist of ten or more large bamboos lashed together with cross-pieces of larger bamboo to keep them in position. The raft is about 11 ft. in length with a beam of 6 ft. and is fitted with a combined thole pin and lumber iron. The rafts are propelled by oars. The long lines of Amoy are made of lengths of China grass generally ranging from 300 to 400 ft., joined together to form a unit sometimes as much as a mile long. Each section carries up to 100 snooded hooks every 5 or 6 ft. Both ends of the line are buoyed by short lengths of medium-sized bamboo with earthenware sinkers to keep them erect. The length of the buoy ropes is, of course, regulated to suit the depth of water. A large stone sinker wired to form a short bridle is hung from the end of each complete long line and anchors it in position. The rafts, each carrying two men,

1 There is a very good model of the Amoy fisherman and the rafts in the Science Museum, South Kensington.

are dropped by the parent ship; and each drifts or is rowed to the selected position and lays out its long line, which is coiled in a tub on the raft. During the fishing periods the rafts move along their lines, hauling,

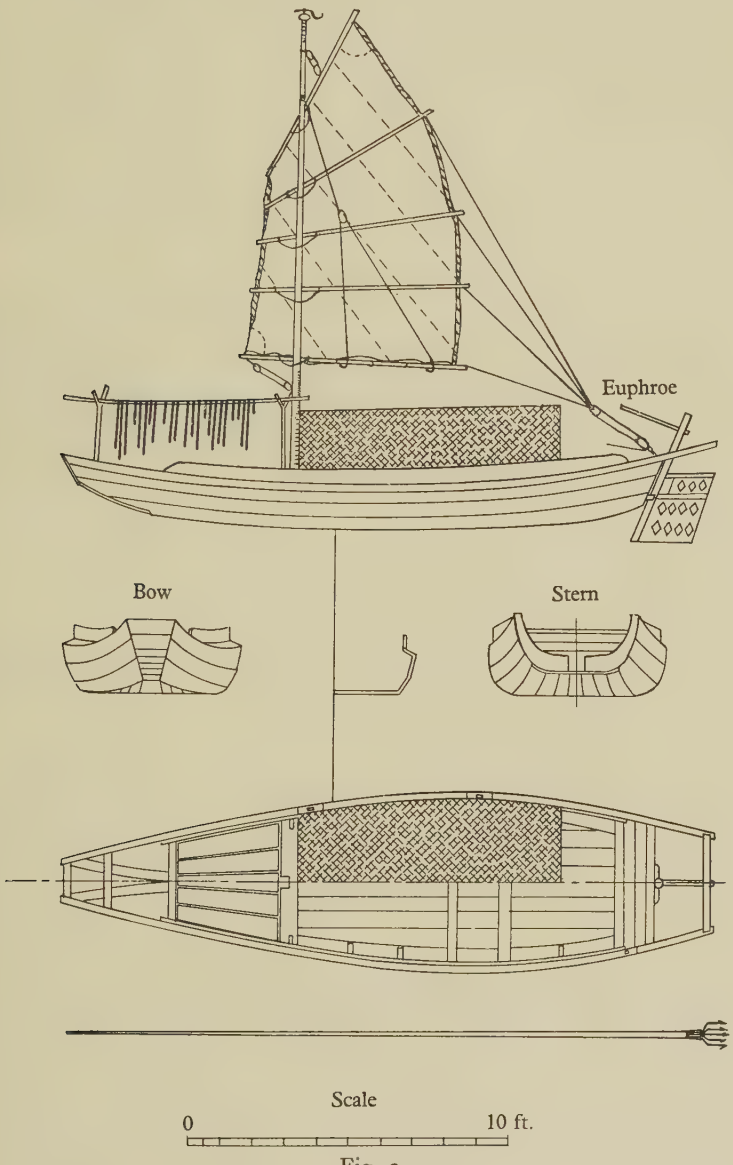


Fig. 2

removing the catch and rebaiting the hooks, until the end of the line is reached. During the operations the parent ship attends the rafts, removing the catch at regular intervals.

Spawn gathering

Pond-fish culture, known as Pisciculture, seems to have originated in China, apparently about 2000 B.C. In the spring fish go up large rivers to spawn, and some obligingly deposit their eggs among the weeds close to the shore. Special men gather the eggs and transport them to the Yü-hong or fish Guilds. The methods of catching the spawn are doubtless much the same as they were hundreds of years ago.

As regards the Yangtze River, the spawning season commences in May and closes about the end of July, at which time the river is rapidly increasing in height and force of current.

A suitable, fairly shallow, spot is chosen under the bank; and stout bamboo poles are driven into the mud-bed of the river, at intervals of a foot or more. Across these rough piles, which may extend out at right angles to the bank for a considerable number of feet, a long plank is laid for the convenience of those tending the nets. To these piles the nets are attached. They are made of extremely fine mesh, which will hardly permit a mosquito to pass through, wide at the mouth, which faces up-stream, and tapering down to a point, leading into an oblong net box, which floats on the surface of the water. Thus, the spawn, entering at the broad end, is forced onwards by the current and eventually lands in the netted box.

Every now and again, these receivers are emptied into kongs (earthenware jars); and so clever do the spawn-gatherers become at their work that they can detect the different species of fish among the almost invisible spawn and sort them out after their kind.

These earthenware aquatic nurseries are kept until the little fish have had a short start in life, and then the work of distribution begins.

Merchants owning ponds purchase these small fry from the fishermen and, in their turn, sell them all over the Yangtze Valley, even as far down as Shanghai. The fish are not sold by weight, but by the thousand. The pond-owner has a small shallow cup, which is estimated to hold a thousand fry; there is also a larger cup, said to hold five thousand fry.

Some of the fry, destined for more distant parts, travels by water in junks, which are often of considerable size, the fry being neatly arranged on innumerable shelves erected for the purpose amidships.

The spawn, when sold locally, is carried away in specially constructed baskets of wicker covered with oiled paper and suspended from the inevitable bamboo pole. These same baskets are used also for shipping the fry to distant ports.

The ponds for rearing and selling fish are to be found everywhere along the Yangtze Valley and are, in this manner, re-stocked; so that, besides

being a means of livelihood for the inhabitants of the Valley, they are a fruitful source of food.

The industry lasts about a couple of months, and a regular colony springs up on the banks of the river, wherever a group of spawning-nets is thrown out.

The entire temporary village takes a hand in the work and then, when the spawning season is finished, vanishes automatically until the following year. When the fish reach maturity, they are transported to Shanghai in special boats, which are described in the *M.M.*, Vol. XLI, p. 170.

The Jumping Fish Boat

Many are the ways in China of catching fish of all kinds, but none is more typically Chinese than the 'Jumping Fish' method, which is practised in many different parts of the country. It is particularly interesting as showing the ingenuity of the people and their skill in procuring for themselves the maximum results with the minimum of trouble and expense.

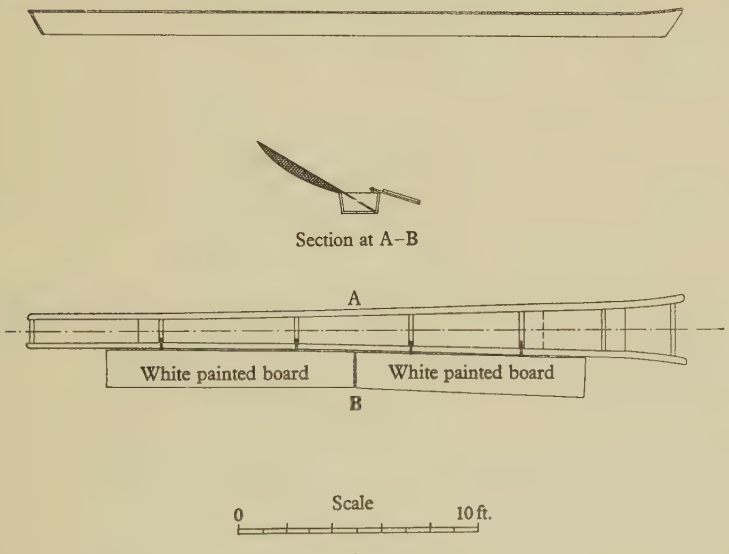


Fig. 3

The boats used in this type of fishing, which is probably peculiar to China, are of special design. The craft illustrated in Fig. 3 comes from the P'oyang Lake and measures 26½ ft. in length with a beam of 1½ ft., with very light draught and, of course, low freeboard. Two boards, painted white, are fitted to one side of the boat, the boards sloping from the

gunwale down to the water's edge. On the other side of the boat is a net, running the whole length of the boat and sloping away from the boards, stretched on short bamboos.

Fishermen go out in these boats on bright moonlight nights. Fish are very fond of light; and, when they see the reflexion of the moon on the boards, the fish leap upon it or over it into the boat and are captured. The boards are always turned towards the moon, so that the reflective power may be increased. The net prevents the fish from falling into the water on the other side. A small compartment, or a tub, serves as a reservoir for the fish caught, mostly anchovies and grey mullets. When there is no moon, bamboo torches are used instead.

A variant of this method of fishing occurs in the delta of the Pearl River in Kwangtung. Here two boats form a fishing unit. They work side by side with the boards facing each other. When a shoal is located, the fishermen give their boats a heavy list with the boats close to and parallel with each other. As the boats close, the fish are frightened by the white-painted boards and leap in all directions, some jumping into the boats. Here they become quickly entangled in dried vines, placed in the bottoms of the boats for the purpose. If one boat only is used, fishing is followed close inshore with the white boards facing the land.

Oyster cultivation on mud flats

The cultivation of the oyster in China dates from a remote age and is carried out with much skill on a very large scale all along the coasts of Fukien and Kwangtung and especially on the sea-board of Formosa and off the mouth of the Yangtze.

The locality chosen is where some spat has been observed and always in places where the beds are uncovered for two or three hours on each tide, and where the current is fairly strong.

Fig. 4. The bamboo oyster.

Two kinds of oyster shells, thick and thin, are selected, the thick ones having a half-inch hole drilled through the centre. Short lengths of split bamboo, 1½ ft. long, are pointed and split to about half the distance down. A thin oyster shell is then inserted in each split near the bottom end. The two top ends of each split are pressed together and inserted into the perforated shell and thus held securely (see Fig 4).

When a sufficient number of bamboos have thus been prepared, they are planted closely together on the mud flats. The spat, which comes in

with the tide, adheres tenaciously to the old oyster shell on the split bamboo and rapidly develops into miniature oysters, which in four months or so grow to a size large enough to require moving. The bamboos are then taken up and transplanted about 6 in. apart. When fully grown, after a further 44 months, the bamboos are almost hidden by the oysters, which cluster round them. The usual season for planting is in midsummer, and the oysters are at their best from January to March.

THE MUD SLEDGE

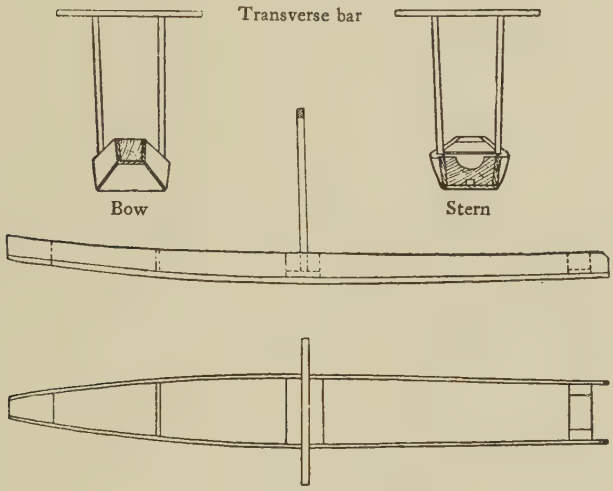


Fig. 5. The mud-sledge.

The Ni-mo-Ch'uan, or mud-touching boat (see Fig. 5), is interesting as being a type that is so accurately described in Chinese history as to enable its identity to be traced beyond question. In the Shih Chi, an ancient history written in 90 B.C., it is stated that the Great Emperor Yü, 2205 B.C., crossed a mudflat on a Ch'iao, as it was then called.

When the mudflats are exposed at low water, the Ni-mo-Ch'uan fleet sets out in search of the slender mollusc held in the greatest esteem by Chinese gourmets.

The Ni-mo-Ch'uan is probably the smallest fishing craft in the world. It is 6 ft. long with a beam of 9 in. The user supports himself by holding with both hands to a transverse bar, while kneeling on one knee. The other leg is used to propel himself over the soft mud flats. The transom has a cut-out portion to accommodate the shin of the leg on which the owner kneels. A basket in the fore part of the craft holds the captured snails.

Cast-net fishing

Cast-net fishing is in general use everywhere. The nets are made of strong hempstring, the neatness of the work being an especially noteworthy feature. It is a very simple net, having the general shape of a disc with a strong cord rove through the peripheral meshes. This circumference is lined with small leaden weights, or sinkers, at short intervals. A hauling line is attached to the central point of the disc of netting. The net is cast high into the air; and, as it flies, it opens and so covers a wide circle. It is drawn below the surface by the weight of the leaden sinkers. The fish are caught in the net by their gills. The periphery of the net is usually in the neighbourhood of 24 ft. The net is thrown from a boat or from the shore.

Cormorant fishing

Cormorant fishing is carried out in lakes, rivers and canals where there is no current. The boats used vary very much; but an ordinary sampan or bamboo raft is by far the most common. At Ichang there is a type peculiar to the district, which consists of two miniature sampans joined together by a board at a distance of about 18 in. apart.

This method of fishing is too well known to require more than passing notice here.

Otter fishing

Fishing with a live otter is, perhaps, peculiar to the immediate neighbourhood of Ichang, where it is very common. The boat drifts slowly, while a fisherman casts his net in the manner already described. He is assisted, however, by one or more trained otters, which are attached to small, light bamboos by means of an iron chain fixed to a sort of leather harness. The fishing-net ends in a long neck with an aperture, through which, after the net has been cast, the otter is inserted and performs its task of stirring the fish out of the mud and crevices of the bottom of the lagoon, so that they get enmeshed in the net when it is drawn tight. Otter, net and fish are then all hauled on board together.

Hope springs eternal; and, despite the fact that very few fish are ever caught, the otter remains a valuable and expensive ally of the fisherman, a well-trained animal costing as much as $50.00. The sampan, when used for fishing by either method, is controlled by a man standing in the stern, who operates two miniature oars. The coffer-dam between the two foremost bulkheads contains a small water-tank, fitted with a trap-door, inside which the captured fish are kept just sufficiently alive to remain technically 'fresh'.

In Chungking the practice is for the otter to dive over the side at the word of command and hunt the fish into the net. What it does below the surface is not quite clear, but it is often to be seen emerging independently of the net with a fish in its mouth, which it readily gives up to its owner.

Otter fishing is a much more remarkable performance than that of the cormorant with a ring round its neck. It is most interesting to find the otter, which many anglers regard with alarm and dismay, coming to the rescue in a region where fish are exceedingly hard to catch. These animals are obviously very well treated and on excellent terms with their masters. Has any other race than the Chinese ever trained them for such a purpose?

The hand rod

There are many references to fishing with a rod in the old Chinese classics: the best known, which dates from 1122 B.C., concerns the famous Prime Minister Lu Shan. This good and wise man used to fish with a straight hook, so that no fish need be caught against its will, while the fish self-sacrificingly vied with one another to attach themselves to the line, so as to supply the sage with food.

The rod is used all over China in the creeks and canals in the interior.

Fishing in rapids

Fishermen throughout the length of the Upper Yangtze, with remarkable perseverance, comb the waters with their hand nets from boulders on the shore. Presumably they must occasionally catch fish, or they would abandon the practice. I myself have yet to witness the capture of a fish, but one very experienced and observant friend affirmed that he had seen three fish landed in his ten years' experience. Another, more fortunate, saw one caught on his first trip up river. The net, like a large butterfly net, on a circular bamboo frame, is scooped down with the current. The fish when caught must be prizes indeed. It is noteworthy that the fishing ground selected seems usually to be on a rocky point with access to broken water. The site is also favoured by wild cormorants, who apparently work with more success.

I have, however, seen many fish caught in this manner at the Hsin T'an in spring. Here the river seems to abound with fish, and every pass of the net seemed to bring up six or more. The operator would swing his net over his shoulder on to the rocks behind, where an assistant secured the flapping fish.

Long lines are also laid in swift water near the bottom with many hundreds of unbaited hooks. The fishermen affirm that they count on the fish 'rubbing

their lice off' against the stones. The upper end of a small race is considered to be the best, but every rocky point has its local importance at some time of the year.

The casting rod of the Min Kiang

According to the Chinese, the Min and not, as is commonly held by other authorities, the Kinsha is the parent stream of the Yangtze. From a navigational point of view there is everything to support this opinion, for the Kinsha is navigable for only 58 miles above Sui fu, whereas the Min is navigable at high water for 133 miles to Ch'êngtu, the provincial capital. Its source is situated near the edge of the Tibetan plateau, 13,000 ft. above the sea: after passing Sungpan, 9,500 ft. above the sea, the Min crashes down through a 100 mile-long gorge, until it finally emerges from the Szechwan mountains on to the Ch'êngtu Plain at the mountain town of Kuanhsien.

This most picturesque and attractive city stands at the clear-cut boundary between east and west Szechwan and has all the diverse features of a frontier settlement. Here the Chinese, the tribesmen and Tibetans mingle in the narrow streets. Coolies with unbelievably heavy loads bring down medicinal herbs, skins, wool, deer horns and musk and take back salt, cotton, sugar, tools, straw sandals and tea.

The plain of Ch'êngtu here is amazingly fertile, thanks to an irrigation scheme which has been in operation for one thousand years. In the old Imperial days the area was known as the Prefecture of Heaven. It is the only large expanse of level ground in the mountainous province of Szechwan. Nor, indeed, is it really level; for it slopes gently down, the height being 2,300 ft. above sea-level. The river at Kuanhsien is clear, 100–120 yards broad and 15–20 ft. deep in the pools; while there are numerous rapids.

In 1939, while studying the boats in this region, the writer came across a Chinese fisherman using a most interesting type of rod. This was a nicely balanced one-piece yellow cane, just under 11 ft. long, with natural joints about a foot apart at the bottom, closing to 6 in. apart at the top. The only fitting was a rattan ring, 2 in. by $2\frac{1}{2}$ in., whipped to the rod tip, with a thin strip of raw-hide sized with gum.

The reel was a short length cut from the thick end of a large bamboo. It was $5\frac{1}{2}$ in. in diameter and $4\frac{1}{2}$ in. deep; a waist was cut round it to accommodate the line; and across the inside a stick was fixed, to serve as a handle and allow the fisherman to hold the reel firmly with the first three fingers of his left hand.

The line was a fine twisted one and was made of 'silkworm gut', a substance prepared from the contents of the silk glands of a kind of silk-

worm. The line probably had a 10 lb. breaking strain. The reel held about 200 ft. of line or 120 turns round the reel. The tackle was quite a good pattern of two hook paternoster. The gut line was moderately fine, fina to refina, or thereabouts. Each hook had a short paternoster arm between it and the gut trace; these arms were about $1\frac{1}{2}$ in. long and made of stiff twisted hemp cord. The hooks were all locally made of excellent design, sharp points and small barbs; the shanks were flattened at the end, and the hooks were whipped to the gut in the usual manner with fine thread. A round pebble was secured in the loop, of hemp, and this loop was attached to the paternoster with hairs from a yak's tail, so that it would break away with a very light pull. The bait used was a fat variety of water creature with six legs and a pointed tail, probably a larva of some sort. The casting was done as follows: the fisherman stood with his back to the water, holding the reel and sinker in his left hand and the rod in his right; he then made a pivoting turn, swinging the weight outwards in an even sweep. With this primitive outfit the angler was able to cast a distance of about 40 yards. The fisherman used four or five rods and, after he had cast, propped up each rod on stones, with the butt pushed into the sand and the reel beside it carefully anchored.

This method of casting is interesting as showing that there is nothing new in the idea of the spool reel, for probably the fisherman of the Min, well away from any suggestion of foreign influence, has been using the tackle for hundreds of years. This form is perhaps the progenitor of the modern spool reel, which has been brought to perfection only of late years, another example of how the Chinese have originated a device without developing it beyond its crude form. It would be interesting to know if this could be the original prototype of our modern light casting rod and spool reel.

* * *

Chinese fishing has received very scant attention from the authorities interested in European fishing. This seems a matter for regret; for, even if the methods adopted by the Chinese are primitive, they have behind them hundreds of years of experience and have been found well suited to their needs.

NOTES

SPEED UNDER SAIL

(See *M.M.*, Vol. 43, p. 225)

Much has been written and published in nautical books and magazines during the last thirty years on the subject of 'Speed under Sail'. Many writers have devoted their efforts to discrediting the exceptional 'Day's Runs' recorded as having been attained by some of the wooden clipper ships of a hundred years ago. Some of these writers quote the best achievements of iron and steel ships of which they have personal knowledge, and express the opinion that the exceptional 'Day's Runs' recorded by the old wooden clippers were impossible of achievement.

The contentions of some writers are weakened by comments which have no connexion with the subject of the speed attained in the 'Record Day's Run', such as the passage during which the 'Record Day's Run' was attained being only an average one. It is mentioned that the passage from Liverpool to Melbourne in 1854, during which the *Champion of the Seas* made the 'Record Day's Run' of 465 nautical miles, occupied 72 days. Many other ships have made much better time on passage between the U.K. and Melbourne.

Naturally these exceptional 'Day's Runs' were only momentary achievements, and had no bearing whatever on the time taken by the ship concerned on her passage from one port to another. The time taken on the passage would depend on the winds and weather encountered by the ship during the passage, and the capabilities of the seaman in command. The ship might have had a week of light winds before the favouring gale which enabled her to make the 'Record Day's Run'; and she might meet head winds after it, and so lose much time.

At least seven of the old wooden clipper ships of the 1850's are credited with 'Day's Runs' ranging from 411 to 465 nautical miles from noon on one day to noon on the day following. This represents an average speed for the 'Day's Run' of 17–20 knots per hour, an exceptional achievement for a ship driven by the wind alone. Such a speed was not attained by a power-driven vessel for twenty years or more. All these seven clipper ships were new ships, British owned, but built in the U.S.A. Six of them were built by one naval architect, Donald Mackay. These ships varied in size from the *Lightning* of about 1200 tons to the *Great Republic* of about 3000 tons register. They were wonderful creations of outstanding ship designers.

Some very competent and experienced seamen of the latter days of Sail have expressed incredulity that such speeds could have been attained. Among these is the late Captain James S. Learmont, who was an outstanding sailor-of-the-sail, whose acquaintance I was privileged to have. My experience in square-rigged ships was limited to nine years, 1900–1909, in iron and steel ships of varying vintage built between 1876 and 1891. I served from boy to First Mate in them before 'giving up the Sea and going into steamers'. One of the ships in which I served was the *Wanderer* of Liverpool, a big steel flat-bottomed four-masted barque of the type known as the 'carriers of the nineties'. I have seen this big ship make 57 miles *through the water* per 4-hour watch, recorded by a perfectly reliable Bliss log, and keep it up. This is a speed of over 14 knots an hour *through the water*. With the help of $2\frac{1}{2}$–3 knots set per hour caused by the following gale-force wind, she was covering the ground at $16\frac{1}{2}$-17 knots; and it is the distance covered from noon to noon *over the ground* which counts in the 'Day's Run'. It is also on the basis of this distance covered *over the ground* in the 'Day's Run' that the average speed per hour of the ship is calculated, not on the speed by log that she is actually making *through the water*.

Captain James Learmont quotes the *Brenhilda* as having made 16 knots for 18 hours in relatively smooth water somewhere off the South American coast. He does not mention any assistance from current or set, and it is probable that none was experienced under the circumstances he quotes. But if he had driven the *Brenhilda* at that speed *through the water* when running the easting down,

the ship would have had 2½–3 knots an hour set or current with her, and would have made 18½–19 knots *over the ground*. This compares very closely with the average speeds of the old wooden clippers of a hundred years ago in their exceptional 'Day's Runs' which Captain Learmont considers were impossible.

If the *Brenhilda* could attain such a speed, and the big steel flat-bottomed *Wanderer* could attain 16½–17 knots *over the ground*, it is only reasonable and logical to assume that those outstanding wood clippers of the 1850's could attain greater speeds. Those old wood clippers were designed especially for speed. No other consideration was taken into account except the structural strength necessary to enable them to stand the strain. Cargo carrying was disregarded. I therefore give full credence to the 'Day's Runs' claimed by Captain Anthony Enright for the *Lightning*, and by Captain Alexander Newlands for the *Champion of the Seas*. Both those master mariners were men of high repute in their profession for their integrity and abilities as expert seamen.

Speeds recorded by hand log through the water are not as accurate or reliable as speeds recorded by a patent log towed by the ship. I have, however, recorded a speed of 12 knots by hand log in a 1500–ton full-rigged ship running before a strong gale. I found no difficulty in hauling in the log with the assistance of *one* apprentice only, while the other boy reeled up the log-line. I would imagine that a hand log which required 'three apprentices, the officer of the watch' and a seaman to haul in the log at 12 knots, must have had a wood main hatch cover on the end of the log-line. It does not require so many men to take in the patent log to-day on a steamer doing 16 knots or more.

The strain on a ship's hull, when running before a gale, is much less than when the wind and sea are abeam, or when the ship is close-hauled and pitching as well as rolling. When running the strain falls mostly on the masts and rigging. The case of the ship *Champion of the Seas*, when making her record run of 465 miles in 1854, is a case in point. Captain Newlands records that he had to run off his course owing to the force of the gale, evidently for prudent reasons to minimize the strain and risk to the ship. Having to run off his course resulted in the ship making considerable unnecessary 'southing'. When the weather moderated next day the ship had naturally to steer a more northerly course to make good this loss of latitude, as she was nearing Australia by that time. Her 'Record Day's Run' did not help the ship directly on her course to Melbourne, but it did show the speed of which she was capable.

In the case of the *Lightning* on her 'Day's Run' of 436 miles in the North Atlantic on her maiden passage from Boston to Liverpool, it is asserted that her log records: 'Hove the log several times, found the ship going through the water 18 or 18½ knots, lee rail under water and rigging slack'. A new ship with hemp-rope rigging, on her maiden passage, with a wind of gale force on the beam, would naturally lie over until her lee rail would be near or even under water, and her lee rigging would most definitely be slack; but her weather rigging would be taut enough. In this case the captain was noted for carrying sail even to the point of rashness.

In 1907 I left Glasgow in an old frigate of 1876 vintage, with wire rigging set up by hemp lanyards. She had new topmasts and topgallant masts. We struck a W.S.W. gale and had to beat her down the Irish Sea under topsails, and even under this reduced sail her rigging was slack enough. We had to put frappings across from backstays to backstays, but we got the old frigate down past Tuskar and out into the Atlantic, when fortunately the wind veered to north-west. It took us 6 days hard beating, but we passed the Tuskar while other ships were still lying at the Tail o' the Bank.

In considering 'Speed under Sail' it is not reasonable to compare the capabilities of a small coaster, or a yacht, with a big deep-water clipper ship ten or twenty times her size. The big ship can stand up to weather which would make the smaller vessel heave to. For a small vessel to attain 14 knots is very exceptional, but it was common enough for a deep-waterman to do so.

'Record Day's Runs' have no bearing on, or connexion with, 'Record Fast Passages'. Many a 'Record Fast Passage' has been made by relatively indifferent ships as regards speed. The steel four-masted barque *Howard D. Troop* made a passage of 14 days from U.K. to New York, as good as any of the old packet ships of a hundred years ago. The modern steel four-masted barques *Priwall* and *Padua* ran out to South Australia in 66 days not long before World War II; this

compares favourably with the passages of the old clipper ships, yet they were just big steel carriers. There are many more instances of fast passages being made by ships which never achieved any outstanding speed.

The 'Record Fast Passage' is the result of various factors. Favourable winds are essential; but a more essential factor is the seaman who knows where to find them and how to use them. This is evidenced by cases of ships making consistently good passages for years under one captain, and showing much less favourable results when another and less expert seaman takes over. Similarly, there are cases where indifferent ships have suddenly made consistently good passages when a new and more expert captain takes command, a captain who knows how to carry sail with prudence, who exercises unceasing vigilance, and who knows where to find the winds he wants according to the season of the year, such an expert seaman, for example, as the late Captain James Learmont.

Although I do not agree with Captain Learmont's opinions as given in 'Speed under Sail' in the August 1957 *Mariner's Mirror*, I have the greatest respect for his capabilities as an expert seaman of the latter days of sail. He was the type of master mariner who was admired and envied for his knowledge and seamanship, the type of seaman who made passages, who knew his ship and her capabilities. He was one of those real sailors-of-the-sail who successfully pitted his wits and craftsmanship against the strength of the elements, and, even when in their wildest fury they sought to destroy him, he made those same elements serve to speed his ship upon her voyagings.

Peace to his ashes.

H. DANIEL

The article by the late Captain Learmont attacking claims of 24-hour runs in excess of 400 nautical miles by American clipper ships raises but one important new point, and that is the probable ability of wooden clipper ships to reach speeds in excess of 16⅔ knots.

It should be first noted that the list of claims given in the Learmont article is not complete by any means. There are other claims: *Flying Scud* (449 nautical miles on 6 November 1854), *Red Jacket* (417 nautical miles on 19 January 1854), and *Marco Polo* (428 nautical miles on 7 January 1854). In addition, there are claims of runs of 400 nautical miles for the *Red Jacket* (6 July 1854) and for the *Invincible* (20 December 1851). Abstract logs for *Lightning* and *Red Jacket*, covering a period in which 400-mile, or better, runs were made are in existence. There are, likewise, a larger number of cases where runs in excess of 350 nautical miles in 24 hours are claimed; some supported by logs or abstracts.

It is not my intent to discuss these runs, nor the authenticity of the supporting data. This has been done repeatedly by competent authorities, such as Cutler, Lubbock and Fairburn. I think it has been generally agreed that the majority of claims of day's runs of 400 or more miles are not supported by tangible evidence that can be checked precisely to-day. I also believe that the chief reason, heretofore, for questioning these claims is the extreme rarity of wind, sea and weather, over a 24-hour period, that would allow any sailing vessel to maintain a high average speed of 16 knots or better. This is known to every practical seaman who has had extensive experience with sailing craft. As they also know, there is an extremely limited range of weather, wind and sea conditions that will permit any sailing vessel, or boat, to reach very high speed for her size and length; and the range becomes increasingly restricted as the sailing craft approaches its individual limit in actual speed through the water. This has led some to suggest that perhaps a period of particularly favourable weather existed on the tracks used in the voyages to Australia, California and China during a part of the 1850's. The idea seems to have been suggested by the number of record runs around 1854. I do not know that any very convincing evidence to support this theory has ever been presented. Personally, I doubt that this idea is sound. It is my opinion that the high speed and record voyages in the 1950's were due to the hull-forms and smooth bottoms of the clippers; to their large rigs in proportion to their displacement and to hard-driving officers commanding large crews. Speed records were the fashion of the times and there was fame and glory to be won.

That old aspersion, the 'American Log', requires little comment. This foolish thing has been

examined many times. In all but two instances the men who made claims of runs exceeding 400 nautical miles in 24 hours were English masters. Are we to suppose they lied to enhance the reputations of American shipbuilders as Learmont suggests? Preposterous; all that the reference suggests is that there was a 'British Log'. Nor is the song-and-dance mode of heaving the log described by Learmont an American practice, though he infers that: 'Since he did not sail on an American ship, he obviously is not a reliable witness.' In the clippers, dead reckoning ('time and distance') played such an important part in navigation that accuracy was much sought. Learmont's description could only apply to a very decadent period in sail, the 1890's and early 1900's.

The arguments by Captain Learmont that are new are the claims that the wooden hulls and the rigs of the clippers were too weak to stand the strains of really high-speed sailing, and that this is proven by the evidences of very great structural loading noticed by him in iron and steel sailing ships of the last quarter of the nineteenth century. The report of the model tests of the German five-master *Preussen* is resorted to as evidence of the enormous power required to drive a sailing ship fast, which would create structural loadings on hulls and rigs. Apparently 16⅔ knots was about the maximum speed under sail that Learmont was willing to accept. It must be observed that he disregards the very critical examinations of speed records of clippers, British and American, by competent authorities and passes judgment almost entirely on his personal experience under sail which, I judge, occurred toward the end of the nineteenth century.

As to the strength of the American-built wooden clipper hulls; the long lives of many of these vessels is really sufficient answer to Captain Learmont. Very hard-driven and record-breaking ships, such as *Nightingale*, 42 years, and *Competitor*, 48 years, had very long serviceable careers. Nor were these two exceptional in this respect, as *Flying Cloud*, 23 years, *Challenge*, 25 years, *Young America*, 33 years, *Wild Pigeon*, 40 years, *Black Hawk*, 31 years, *Gamecock*, 30 years, *Surprise*, 26 years, and *Ocean Telegraph*, 29 years, prove—and these are but a part of the amazingly long-lived wooden clippers.

In addition, the plans and specifications of many American clippers' structural design exist. These show that the type, as a whole, were very strongly built of first-class materials. They were very costly ships to build, for extensive use was made of hook-scarphs, keyed scarphs, knees and strapping to a degree far beyond what would now be required by the classification societies' rules. Having designed wooden vessels up to 160 ft. length on deck, I am aware of the difficulties in the structural design of large wooden vessels—economics would prevent us from duplicating the structure of a clipper in a wooden vessel to-day. The last large American sailing coasters were far weaker in basic structure than the clippers for this reason.

As to the strength of their rig—how much strength was actually required in clippers to drive them 16 knots or better? Captain Learmont's basic assumption is that the power required to reach 16 knots in a clipper was the same—or in direct proportion—to that needed in the iron and steel ships of his day. This is certainly incorrect.

The records of the clipper ships shows clearly that their rigs usually had sufficient strength to enable them to make record passages, at least. Where high 24-hour runs are concerned there is evidence that the rigs were highly stressed with resulting failures. More than that cannot be said, of course, for you are brought up by the question of whether or not the claims for record 24-hour runs are valid.

I think it is best, in this matter, to discuss the relative power required to drive clippers and the iron or steel ships known to Captain Learmont. This must cover other matters than rig alone.

The first point to be made is that the clippers were, with very few exceptions, less than 250 ft. long. The *Great Republic* was 302 ft. long—only six clippers were over 250 ft. in length and thirty between 210 and 250 ft., out of a total of about 370 or 375 vessels classified as American clipper ships, built after 1850. No clippers above 200 ft. in length were built before 1850. The ships to which Captain Learmont refers were all above 250 ft., I believe; *Preussen*, *Bengairn* and *Herzögin Cecilie* were much larger than even the *Great Republic*. The sheer size of the iron and steel ships was enough to create engineering problems of great magnitude, for there are practical limitations in the diameter of rigging that can be conveniently used that were reached in the

largest wooden ships and far exceeded in the basic requirements of the great iron and steel vessels of after 1875. Thus, because of size alone, determination of the relative actual stress-loadings of the clippers cannot be pro-rated on the basis of that of the iron or steel ships.

Next, the power required to drive a wooden clipper ship of the American type of the 1850's, or that required to drive the British tea-clippers like *Falcon*, *Ariel*, *Cutty Sark* and *Caliph* for that matter, was far less *at any speed* than was required in the later steel and iron ships. The comparison is not even relative, as model-tests have shown.

The reasons for this are three—size, form and smoothness of bottom. The relatively small size of the clipper ships has been indicated. This was actually less marked in lineal dimensions than in displacement–length ratio. Generally, all clippers had less displacement per foot of length by a very wide margin than the later iron and steel sailing ships and this alone created a vast difference in power required at all but the very lowest speeds, say under 3 knots, where the difference might be less marked.

The design of low-resistant hulls had been well developed by 1845 in America and also in Britain. The basic rules were as well known then as now—speed was obtained by fine ends and, if possible, by reduced displacement—on a given set of dimensions. Thus the clippers had far less displacement—and therefore capacity per register ton—than normal freighting ships of their period or later. It should be noted here, perhaps, that ships like *Brenhilda* may have been 'sharp' for the last quarter of the nineteenth century, and therefore by courtesy 'clippers'; they were not 'sharp' in the degree shown in *Cutty Sark* or in McKay's and Webb's American clippers, any more than some of the fast wooden American Down Easters could be considered true 'clippers'. Sharpness to a very marked degree, combined with relatively small displacement, was the characteristic of practically all ships holding accepted records for fast runs or voyages.

It is true that very many extremely sharp iron clippers were built in England, from 1850 to 1870. Lines of these show them to be handsome models and capable of high speed in suitable weather. They seem too narrow, on the whole, to be able to carry sail in the strong winds that permit record 24-hour runs but such vessels could maintain an excellent average speed given favourable weather. But, in fact, few iron clippers held records for they suffered much from rapid fouling. The American wooden clippers–and the wooden skinned or sheathed composite tea clippers of England—were coppered and could maintain a smooth bottom on a passage. A rough or foul bottom is a great handicap in any effort to steam or sail fast as skin friction is a very powerful factor in the resistance met with in sailing ships and steamers in practice; speed falls off sharply in a steamer as she fouls up. Iron and steel sailing ships have always suffered from rapid fouling—the periods of calm or of 'drifting weather' that sailing ships would commonly meet on the runs to Australia, the Orient or to the American West Coast would cause very rapid fouling indeed, which affect the total passage time.

Hence, all the factors in design and in hull-resistance were in favour of the wooden clipper ship. Some 25 or more years ago private model-testing was carried out with some noted American clipper-ship lines. The results were never published in full, so far as I know, but it was reported that the tests showed the vessels to have been easily driven in the speed range of 10–20 knots, with the highest efficiency varying from model to model within this range. These model-tests showed that the hull-forms of some clippers, at least, might be driven at 20 knots without excessive power and it was estimated that some had enough sail to permit such speeds, theoretically. Whether any ever succeeded in reaching such a speed is certainly open to question, of course.

It was far otherwise with the big iron and steel vessels of 1875–1910. These ships were intended to be economical carriers and were full-ended, heavy displacement models. Their metal bottoms were relatively rough even when clean, and the ships fouled quite rapidly during a sailing voyage in spite of anti-fouling paints. The iron and steel ships were commonly undermanned and no captain could win fame and fortune by driving his ship hard. On the contrary, any such performance would lead to his being sacked if spars or sails were damaged. In the clippers it was otherwise, crews of from thirty to fifty men were common and a fast passage justified loss of spars, sails or gear.

To assume that *Preussen* was the model ship for fast sailing is as fantastic as it would be to

accept a dray horse as representative of a Derby winner. It is impossible for me to understand how anyone who has seen *Cutty Sark* or her model could think *Preussen* either a fast or attractive ship.

The very limited experience that was possible in the square-riggers, after about 1890, which were neither modelled, rigged, manned nor intended for fast passages, makes Captain Learmont's judgment of the clippers quite unacceptable, so far as his arguments go. The evidence of strains and destructive forces he saw in ships of his day does not support the theory that equivalent loads were developed in the clippers.

While many of us will agree with Captain Learmont's basic thesis—that 24-hour runs in excess of 400 miles are suspect claims—his attack on the clipper-ship type is not soundly based and his conclusions unwarranted on the evidence he produces.

H. I. CHAPELLE

SPANISH PROPAGANDA AFTER TRAFALGAR

In a recent book on Trafalgar, not so much on the battle itself as on its preliminaries and on its effects at Cadiz, *En los Dias de Trafalgar* by Augusto Conte Lacave, there appears a reprint of a pamphlet published soon after the battle purporting to give full details of damage and losses suffered by the British fleet. The author notes that 'although the information does not conform to the truth, it reflects the general belief, not only immediately after the battle, but for a long time afterwards'. He speaks of reprinting it 'because of its rarity' and it seems worth translating because of its unashamed mendacity. The late Dr Goebbels at his best, or worst, never managed anything quite so remarkable in the way of fiction.

Losses and damages suffered by the English Squadron on account of the action fought against the combined French and Spanish fleets in the neighbourhood of Cadiz on Oct. 21st 1805

First Division

Victoria (*Victory*) 100

Was completely dismasted during the action and towed by a frigate sank off Gibraltar on the 22nd. Admiral Nelson received two wounds and died 7 hours after the end of the action. Two Commanders, Major General Vignagoch and 11 officers were killed and 7 wounded. Of the crew 590 were killed, 96 drowned and 209 wounded.

Bretaña (*Britannia*) 100

Was dismasted and sunk in action by the Spanish *Trinidad*. Had 7 officers killed and 11 wounded. Of the crew 359 killed, 200 drowned and 132 wounded.

Principe de Gales (*Prince of Wales*) 98 [not present]

Was sunk in action by the Spanish *Trinidad*.[1] Two Commanders and 15 officers killed and 5 wounded. Of the crew 513 killed, 98 drowned and 272 wounded.

Dreadnought 98

Reached Gibraltar on the 24th towed by a 40-gun frigate and was laid up as useless on account of having 79 shots on the waterline. Her Commander and 5 officers killed and 11 wounded. Of the crew 128 killed and 132 wounded.

Temerario (*Temeraire*) 98

Reached Gibraltar on the 22nd towed by a 40-gun frigate. Laid up as useless because she is damaged below water, has stanchions and timbers adrift and cannot be repaired. Had 2 Commanders and 3 officers killed and 7 wounded. Of the crew 112 killed and 259 wounded.

1 According to later information the fate of this ship is doubtful.

Neptuno (*Neptune*) 98

Was sunk in action by the French *Algéciras*. Had 2 Commanders and 7 officers killed and 5 wounded. Of the crew 193 killed, 122 drowned and 259 wounded.

Príncipe (*Prince*) 98

Was sunk in action by the Spanish *Argonauta* and the French *Aguila* (Aigle). Had 5 officers killed and 2 wounded. Of the crew 125 killed, 121 drowned and 231 wounded.

Second Division—General Collingwood

Renya (*Queen*) 98 [not present]

Reached Gibraltar on the 27th, dismasted and disabled, towed by a frigate, and has been laid up on account of being badly damaged. Had a Commander, 3 officers and 95 crew killed; 5 officers and 102 men wounded.

Canopus 80 [not present]

Reached Gibraltar on the 25th dismasted and has been laid up as incapable of repair. Had a Commander, 2 officers and 45 men killed; 6 officers and 93 men wounded.

Donegal 80 [not present]

Dismasted in the gale on the coast of Barbary and towed into Gibraltar. This ship can be refitted. Had 3 officers and 122 men killed; 5 officers and 93 men wounded.

Tigre 80 [not present]

Reached Gibraltar on the 23rd having lost her main and mizzen masts, but can be refitted. Had 5 officers killed and 4 wounded. Of the crew 98 killed and 102 wounded.

Tonante (*Tonnant*) 80

Also reached Gibraltar, having lost her fore topmast and suffered some slight damage. Had 3 officers killed and 1 wounded. Of the crew 41 killed and 93 wounded.

Spencer 80 [not present]

Also reached Gibraltar, towed by a frigate, on the 22nd and sank in harbour. There were killed 1 Commander, 5 officers and 192 men; 41 were drowned and 153 with 3 officers were wounded.

Sparcista (*Spartiate*) 74

A frigate took her in tow, but she sank in the night of the 21st. Had 2 Commanders, 5 officers and 98 men killed, 244 drowned, 104 wounded with more than 3 officers.

Third Division—Vice-Admiral Calder

Defensa (*Defence*) 74

Was burnt in action and there perished 2 Commanders, 17 officers and 700 men.

Switsure (*Swiftsure*) 74

Was dismasted and towed to Gibraltar, but can be refitted. Lost 2 officers killed and 1 wounded. Of the crew 52 killed and 93 wounded.

Leviathan 74

Reached Gibraltar having lost her main and fore topmasts, but can be refitted. Lost 2 officers and 98 men killed; 3 officers and 52 men wounded.

Orcon (*Orion*) 74

Towed to Gibraltar and came in dismasted, but can be refitted. Lost 1 officer and 78 men killed; 5 officers and 33 men wounded.

Coloso (*Colossus*) 74 [see below]

Reached Gibraltar towed by a frigate and has been made completely useless. Had 3 Commanders, 4 officers and 122 men killed; more than 3 officers and 100 men wounded.

Carnate (*Carnatic*) 74 [not present]

Not in the action because to leeward.

Abukir (*Aboukir*) 74 [not present]

The same because left at Gibraltar. Afterwards came out to cruise before Cadiz.[1]

Fourth Division—Rear-Admiral Bickerton

Conquistador (*Conqueror*) 74

Reached Gibraltar in good condition and is cruising off Cadiz. Had 2 officers and 719 (*sic*) men killed; 2 officers and 34 men wounded.

Revenge 74

Reached Gibraltar towed by two corvettes. Has been laid up as useless and incapable of repair. Lost 5 officers and 83 men and had 3 officers and 124 men wounded.

Aquiles (*Achille*) 74

In the same state as the last. Had 3 officers and 79 men killed; 2 officers and 52 men wounded.

Minotauro (*Minotaur*) 74

Wrecked after the action off Conil. Lost 5 officers and 123 men killed, 142 drowned, 3 officers and 91 men wounded.

Coloso (*Colossus*) 74 [see above]

Suffered the same fate as the last. Lost 2 Commanders, 11 officers and 600 or 700 men of her crew.

Marte (*Mars*) 74

Reached Gibraltar in good condition and is cruising off Cadiz. Had 1 officer and 2 men killed 2 officers and 92 men wounded.

Beleforente (*Bellerophon*) 74

Reached Gibraltar in good condition, though having lost her mizzen topmast, and returned to cruise off Cadiz. Had 2 officers and 43 men killed; 1 officer and 59 men wounded.

Fifth Division which sailed in the evening of the 21st to reinforce the fleet and took part in the action under Rear-Admiral Louis

Ligero 80 [unidentifiable]

Reached Gibraltar on the 22nd towed by a frigate. Has been laid up as useless and incapable of repair. Lost 2 Commanders, 3 officers and 112 men killed; the Rear-Admiral seriously wounded and 5 officers and 92 men slightly wounded.

1 Should therefore be omitted from the number of ships in the fleet which went into action.

Atrevido (*Audacious?*) 74

Reached Gibraltar in good condition and is cruising off Cadiz. Had 2 officers and 18 men killed; 1 officer and 42 men wounded.

Aguila (*Eagle*) 74 [not present]

Not in the action. Is cruising off Cadiz.

Polifemo (*Polyphemus*) 74 [64]

Reached Gibraltar in good condition and afterwards left to cruise off Cadiz. Lost 1 Commander, 1 officer and 28 men killed; 3 officers and 45 men wounded.

Sixth Division which joined the English fleet in the morning of the 22nd and manned part of the fleet; after which it sailed for Malta convoying various ships

Soberano (*Sovereign*) 110

Did not take part in the action, but struck on the coast of Conil and was wrecked with the loss of all hands and the money which she had on board. There were lost 3 Commanders, 12 officers and 900 men.

Relámpago 74 [unidentifiable]

Not in the action. Is off Cadiz.

Duque de York (*Duke of York*) 74 [no such ship]

Also not in the action. Manned enemy ships[1] and lost them on account of the gale. Is off Cadiz.

According to a final summary, out of 35 ships, 5 of which took no part in the action, 10 were sunk or wrecked and 9 damaged beyond repair. The total casualties are given as 5074 killed, 2064 drowned and 3333 wounded.

R. C. ANDERSON

GEOGRAPHICAL NAMES FOR MEN-OF-WAR

In his lecture on Ship Names, printed in the *M.M.* in May 1957, Captain Manning mentioned the *Warwick* of 1644/5 as the first geographical name. In all probability this ship, bought for the Navy in 1643, was named after the Earl of Warwick, her owner. This leaves the *Weymouth* as the first really geographical name; she had been the Royalist *Cavendish* and was captured in 1645. Next came the *Portsmouth* of 1650, but there were quite a number before the *Portland*. *Worcester*, *Tresco*, *Kent*, *Sussex*, *Cardiff*, *Falmouth* all appeared in 1651–2, *Portland* not till 1653.

The case of the name *Monmouth* is very difficult. The yacht of 1666 was, as Captain Manning said, almost certainly named after James, Duke of Monmouth, and the 66-gun ship of 1667 was probably the same. The fact that her semi-sister ship was called *Rupert* tends to confirm this. Now the bearers of the name for the next century or more were all 'rebuilds', 1700, 1722, 1742, 1772; so that the ship had, in theory, a continuous history. At what point can we assume that the geographical sense of the name replaced the personal?

R. C. ANDERSON

H.M.S. *MONMOUTH*

It is my opinion that the name was revived in 1796 purely on traditional grounds and this would have accounted for its revival as one of the 'County' class cruisers. This ship was of course named in a geographical sense, but I do not think it would have been selected unless the name had had a fine history.

T. D. MANNING

1 By 'enemy ships' French and Spanish are meant.

NAVAL BUTTONS FOUND AT FORT GREAT GEORGE, MONK'S HILL, ANTIGUA

The restoration of the Dockyard at English Harbour, Antigua, having aroused much local enthusiasm, the Hon. P. D. MacDonald, C.M.G., Colonial Secretary, Leeward Islands, and Mr Ogden P. Starr devoted much time during 1956–7 to digging in Fort Great George.

This fort, the oldest in the island, was built between 1689 and 1705 and was the most heavily armed, its importance being due to the fact that from an eminence of 700 ft. on Monk's Hill it commanded both Falmouth and English Harbours.

During the course of their excavations, the two diggers were fortunate enough to find at depths of between 3 and 18 in. the buttons and badges of some fifty regiments of the British Army. A complete set of these has been placed on show in the Museum in Nelson's Dockyard, and many have been presented to regimental museums. They found besides a number of naval buttons and have given a selection to the National Maritime Museum. These include commissioned officers' buttons of 1774, 1787, 1795 and 1812, those of a surgeon of 1805 and of a master and of a purser of 1807, besides two pewter buttons incised with a foul anchor.

While none of the officers' buttons are new to the Museum collection, additional specimens of this period are always of great interest and are very welcome. There still remain one or two problems to be cleared up and the maker's names on buttons are sometimes of help in determining dates.

The two pewter buttons are undoubtedly those of rank and file of the marines. I am informed by Colonel J. T. Hall, R.M., that when the corps was formed in 1755 simple foul-anchor buttons were worn, but that by 1776 a wreath around the anchor had been added. No date for this addition has been traced, but it probably took place about 1771 or 1772 when several modifications to uniform occurred.

It is hoped that the successful exploration of this site may encourage others to make similar searches either in Antigua or elsewhere.

W. E. MAY

THE SWEDISH SHIP *WASA* OF 1628

Prior to Sweden entering The Thirty Years' War the king Gustavus Adolphus built up the Swedish Navy in contest with other Northern Powers for the supremacy of the Baltic. One of the new ships, the *Wasa*, was laid down in Stockholm in 1626 and finished in the summer of 1628. She had a keel of 128 ft., length from stem to sternpost about 160 ft. and a beam of some 36 ft. She had three decks and is stated to have carried 64–72 guns and among them no less than sixty 24-pounders.

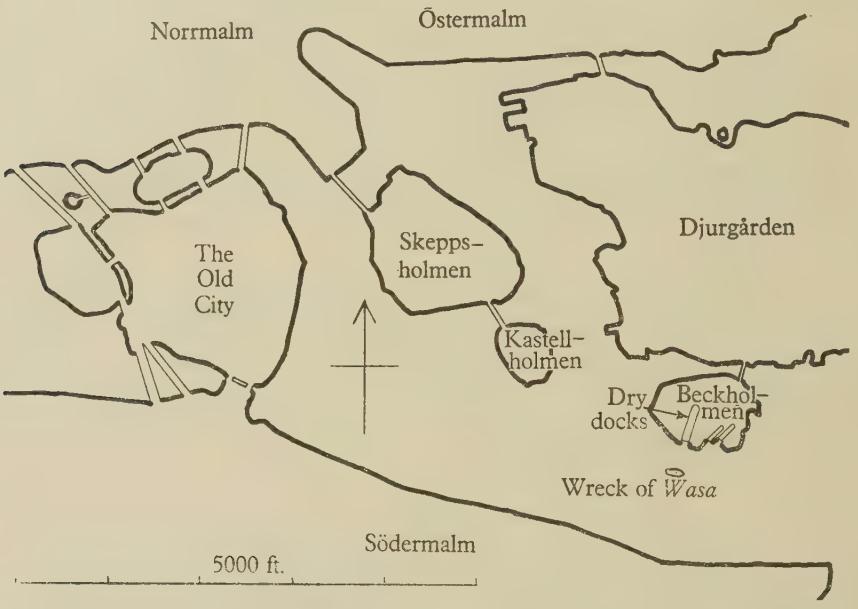
When leaving Stockholm on her first voyage 10 August 1628 she capsized in the very harbour of Stockholm. She just fell over on her side almost as soon as she left the wharf and sank in 100 ft. of water, some fifty persons being drowned in her. There was a light breeze from south-west, the ship heading east under topsails and foresail. It is further reported that a light squall came down the high foreshore of Södermalm, the south part of Stockholm, and caused the tragedy. When the ship had settled on the bottom her main topgallant crosstree stood 16 ft. above water. Some attempts were made to salvage her, parts of the rigging was recovered and by use of a diving-bell some of her bronze cannons were salvaged as late as 1665. By then, of course, nothing was seen above water and, gradually, the site of the wreck was forgotten.

Historians always have known about her and there has been some writing on her tragedy. Actually until last year nobody really knew where the ship was lying, the historians being concerned with nothing but the archives, and they did not give the place in detail.

Last summer, however, a young amateur researcher, Mr Anders Franzén of Stockholm, went afield, and sounding from a small motor-boat he examined the principal humps on the bed of the harbour according to the Harbour Board's special chart. He armed his lead with an ordinary wad punch, and when trying it on one big hump his lead stuck and when broken out the wad

punch held a piece of blackened oak like a stopper in a bottle. Subsequent sounding then proved that there must be a large ship standing some 20 ft. on the bottom. This was at the end of August 1956. The position is shown on the sketch-map below.

Then things moved rapidly. The commander-in-chief, Royal Swedish Navy, arranged for the Naval Diving School to put a training course over the wreck, and the divers could soon ascertain that the ship in question was very old with three tiers of gunports. She rests in 18 fathoms of water in 12 ft. of semi-organic mud, the refuse of the city, on a bed of rather stiff clay. The water all around her is inky black and the visibility is very low, a powerful lamp penetrates the murky blackness a few feet only.



Outline map of the central parts of Stockholm showing the wreck of the *Wasa* 300 ft. south of the entrance to Gustav V's dry-dock on Beckholmen Island.

Operations ceased during the winter months but this summer investigations have been resumed. Very few objects have been brought up as the divers work chiefly with mud-sucking and jet-dredging to clear the space around the wreck. Apparently her lower parts are all intact, but, naturally, the superstructure is much damaged. The upper decks are to some great extent stove in from stones and rocks that have been dumped over her. Also it appears that in the early attempt to salve her bronze guns the weather deck above them was somehow burst open to get at the guns. There are quite a number of anchors entangled in her beams and woodwork, some of them with chain-cables attached, and she must have been a real trap for ships anchoring above her. From her upper gun-deck downwards the divers report her to be all sound, her black oak being as hard as iron. She has two tiers of square gun-ports and above them the third tier with at least some circular ports.

Hopes are that she can be salved, but as yet nobody really knows if it can be done technically and—alas—financially. At present, 1 September, the Navy divers are trying to dredge a tunnel under her with the view of ascertaining the possibility of putting lifting warps under her belly, but the black slime on the bottom of Stockholm Harbour makes it no easy task.

The *Wasa* is by far the most important marine discovery made in Sweden. Here, in the middle of Stockholm, we have an early Swedish three-decker which foundered all standing when new and fully equipped springing into life to confirm the sparse documents of the archives. The fresh water of Stockholm Harbour holds no coral and no Teredo worm and all the wood of the hull is intact except for damage done intentionally or accidentally during these 330 years. Surely nowhere else in the world will such an historical ship be found. It is not known as yet if she can be raised.

SAM SVENSSON

AN UNRECORDED NELSON PORTRAIT

On Trafalgar Day 1930 the late Sir Geoffrey Callender, in a letter contributed to *The Times*, summarized the history of one of the least-known Nelson portraits, that by Matthew Keymer, which hangs in the Town Hall at Great Yarmouth. Briefly, the circumstances were that Nelson landed at Yarmouth with Sir William and Lady Hamilton on 6 November 1800, and put up for the night at the Wrestlers Inn. The Hamiltons had brought with them one of the many versions of Nelson painted in Sicily by Leonardo Guzzardi, and they enquired for a local artist able to make a copy.

At that time there was a Norwich man, Matthew Keymer, practising in the seaport, and he was recommended for the job. Like almost everyone else who painted Nelson, he made more than one version, and, with the speed with which such things were done in those days, a popular print was made from Keymer's work. This was by J. Young, and it was on sale by early December 1800.

Indifferent artist as he was, Keymer was not satisfied with making a copy from another indifferent man. He wished to achieve a rendering of his own, if possible from the life. Indeed, anyone who has ever looked critically at the various Guzzardi versions soon realizes how bizarre they are, without insight, and theatrical in style. It seems a pity that Sir William Hamilton, who was one of the shrewdest judges of painting of his time, was unable to find anyone better to paint Nelson during the sometimes weary months he spent in Sicily in the service of the King of Naples. A pencil sketch by Charles Grignion, done at Palermo in 1799 is worth, as a likeness, all the Italian versions put together.

Keymer got his chance in March 1801, when Nelson came back to Great Yarmouth. The *St George*, flying his flag as second-in-command to Sir Hyde Parker, was anchored off-shore, and as Sir Hyde needed much prompting to start off on his foray to the Baltic, Nelson had a few days, from the 6th to the 11th of the month, during which he could give sittings to Keymer. The place was the familiar Wrestlers Inn, and a local citizen called Samuel Aldred had the chance of conversation with him as he sat. The memory remained vividly with Aldred all the rest of his life.

The resultant work was very different from the Guzzardi copy. A sketch of it is at Greenwich. This was for a long time without attribution (it appears as item No. 29 in my list of Nelson portraits from the life published in the *Mariner's Mirror*, Vol. 42, No. 4, November 1956, p. 322): but I have lately had the chance to examine a version, definitely attributed to Keymer and deriving from Norfolk, belonging to Captain D. H. C. Cooper, R.N., of this Society. It is apparent from this that the Greenwich sketch is the basis of Captain Cooper's picture.

As recorded, Keymer made his preliminary study in March 1801. Captain Cooper's picture, or at any rate finishing touches to it, are of later date, for the artist has included all Nelson's orders of chivalry, the Bath, the Order of Ferdinand of Naples, the Crescent of Turkey, and the Joachim of Leinengen, the last of which he received in 1802. Keymer has also given him the rank of full admiral, one which he did not live to reach. Captain Cooper's canvas is 35×27 in. No one could call his a flattering or indeed an outstanding representation, but as every picture based on actual sittings has interest, it is proper to record it. Keymer may have done still others; if so, it would be good to hear of them.

A point of interest in Keymer's copy from Guzzardi is that Nelson is hatless, and his face is inclined to the right of the picture. In Keymer's own version he wears a cocked hat, and his face is inclined to the spectator's left. In both the Greenwich sketch and the more finished product there is an awkwardly placed flick of grey hair close to Nelson's sightless right eye.

OLIVER WARNER

THE KING AGAINST LUKE RYAN

(see *M.M.*, Vol. 43, p. 28)

With reference to Olive Anderson's note on the above in Vol. 43, p. 240, of the *M.M.* I should like to explain that in describing Ryan's career as 'unusually romantic' I meant to agree with her that it was 'exceptional rather than typical'. Probably I used the words I did because I was thinking as much of his life before he was captured as of his trial and reprieve. Needing to compress into a short article the contents of (literally) stacks of documents I had to omit most of the racy evidence sent from Ireland about his early doings and consequently much romance, so I ought to have expressed myself differently.

Most unluckily for me Mrs Anderson's note on American prisoners of war in Vol. 41, No. 3 of the *M.M.*, followed by her important paper in Vol. xxviii of the *Bulletin of Historical Research*, did not appear till I had collected practically all my material. If her notes and essay had appeared earlier they would have provided me with pointers to many papers which I had to find for myself. Her writings are of course invaluable to anyone studying the war of 1775–83, and I sincerely hope she will publish much more on the subject, especially about the privateering war which went on alongside the naval one throughout those years. But in all humility, while agreeing that Ryan's case was exceptional I venture to disagree with her statement that 'the striking thing about Luke Ryan and his four fellows is the energy with which the case against them was prosecuted and the government's apparent determination to make an example of them, in view of their notoriety and the publicity their case received'. Actually it was not one case but three, though the three trials occurred on the same day, Ryan and Macatter being both tried (separately) for piracy while Smith, Casey and Farren were tried for mutiny in the English privateer *Charlotte*.[1] As regards notoriety Ryan was already notorious for running away with the *Friendship* and for getting his previous trial postponed, as well as for his privateering exploits, but Macatter and the mutineers never received anything like so much attention from press or public. My contention, for what it is worth, is that Ryan's case was exceptional, not because Lord North's government was on this occasion less merciful than usual,[2] but because, first, Ryan was an exceptionally resourceful person and, secondly, a change of government occurred at exactly the right moment to save him. Lord Rockingham's advisers probably considered that as he had attracted to himself so much attention and so many sympathizers his reprieve would help to convince the populace of the new government's firm intention to end an unpopular war. In common fairness they had also to reprieve those sentenced to be hanged with him, sacrificing only the inconspicuous Casey as, I cannot help thinking, a sop to the irritated King.[3]

G. RUTHERFORD

[1] Eight of their fellow mutineers were acquitted 'on which they immediately entered the King's service'. (*Political Magazine*, Vol. iii, p. 219.) This procedure was usual, as stressed by Mrs Anderson.

[2] But was it normally as humane as Mrs Anderson implies? I see no reason to doubt the circumstantial account in the usually reliable *Political Magazine* of the hanging on 4 December 1781 at Execution Dock of William Payne, James Sweetman and Matthew Knight. Their bodies were, as was customary, ordered to be hung in chains and that of Payne, a Norfolk man, who had skippered a small French privateer, the *Cerf Volant*, was applied for by the mayor, corporation and merchants of Yarmouth and hung on Yarmouth beach. Sweetman and Knight, who had been respectively lieutenant and pilot in the French privateer *Comte de Guichen*, were from Rush like Ryan and witnesses brought from Ireland for Ryan's first trial were used against them. (See *Political Magazine*, Vol. iii, pp. 215–17, and P.R.O. H.C.A. 1/23.) I have the perhaps mistaken impression that after Yorktown sentences became more severe and were more often carried out.

[3] It is plain from the King's letter to Lord Shelburne who presided over the Cabinet Meeting in question (see *Letters of George III*, ed. Fortescue, Vol. vi, No. 3741) that he gave his consent to the reprieves with extreme reluctance. Had Lord North still been in office and Sandwich instead of Keppel First Lord it is unlikely that reprieves would have been asked for.

WATSON'S TELEGRAPH TO THE DOWNS

There are some mysteries in connexion with this subject. In the first place, according to letters quoted as testimonials in Watson's Code, Barnard Lindsay Watson was being addressed as 'Lieutenant' in 1827 and 1841 by all sorts of authorities such as the Chamber of Commerce and the Harbour-Master at Liverpool, and the Trinity House of Hull. What was he a lieutenant of? It seems clear that he was not in the Royal Navy as there is no trace of his name in the Navy List or anywhere else that I can make out. He was in correspondence with the Admiralty in 1842, and it is obvious that he was not then recognized as a lieutenant. The references to him are as 'Mr' and 'This gent.', whereas had he been a lieutenant he would have been referred to as 'Lt.' and 'This officer'. In the Digests he is scheduled under 'Pro. W' instead of 'Lts W.'. In another place the Admiralty seem to think he is two people for he is referred to as 'Meesrs Barnard *and* Watson' and scheduled under 'Pro. B.'. All this must denote that the Admiralty had no idea that he was a naval officer.

One cannot help feeling that there was something a little rotten in his affairs in 1842; he was worrying the Admiralty to make him an annual grant towards the upkeep of his telegraph lines, in the nature of £1200 or £1500, to which their Lordships replied that the probabilities of their using his telegraph were so small that they could not think of giving any such sum, and offered him ten shillings each time he handled an Admiralty message. We know that Watson's Telegraph Company did send and receive such signals. There was the instance of his being asked to 'Stop Rhadamanthus' at Sheerness (quoted in *M.M.*, vol. xx, p. 351), and his subsequent report that the ship had been stopped, and the Board minute to 'Thank him'. Watson's terminal station on the shot-tower at London Bridge was destroyed in the famous and spectacular fire at Southwark on 19 August 1843, and for some unexplained reason that was the end of Watson and he is never heard of again. The destruction of the shot-tower station, though most crippling, was not necessarily fatal. Watson's office at 83 Cornhill was not affected, and it would have been no great trouble to have sent his messages to and from the next station at Honor Oak (One Tree Hill) by messenger on horseback. This was the sort of proceeding that was always taking place in times of fog or poor visibility in London, and it is well known that Admiralty signals on the Portsmouth line were taken to or brought from Chelsea when the Admiralty Whitehall semaphore was obscured. Why should Watson entirely abandon his lines to Deal and the North Foreland just because the one station had been burnt down? It certainly has the appearance of his taking the opportunity to get out, possibly through financial failure.

HILARY P. MEAD

FIVE CHANGES OF NATIONALITY

In his note in *M.M.* Vol. 3, p. 239, Dr Anderson says that the *Cumberland* became the Spanish *Principe de Asturias* and may have later become the Neapolitan *San Carlo*.

In his history of the Austro-Hungarian Navy recently published in Graz under the title 'Die Flagge Rot-Weiss-Rot', Friedrich Wallisch mentions the *San Carlo* (p. 25) as a 70-gun ship of the line obtained from Naples (no date given) by the Emperor Charles VI and Prince Eugene, as nucleus for an Austrian Navy, along with the 60-gun *Santa Elisabetta* and the 40-gun *San Michele*.

According to Wallisch, after the death of Eugene: 'Niemand kümmerte sich mehr um die Schiffe, die in Triest vermoderten. Schon 1737 war das von Ratten und Bohrwürmern zerfressene Linienschiff *San Carlo* eines Tages mitten im Hafen plötzlich gesunken.' So, if *Cumberland* and *San Carlo* were the same ship, that was her end.

Incidentally, the *Mémoires de M. du Guay-Trouin* (Mortier, Amsterdam, 1748) contain on pp. 119–36 the French leader's dramatic account of the action in which *Cumberland* was taken, and some fine illustrations are at the back of the book.

J. DE C. IRELAND

WIRE RIGGING

(See *M.M.*, Vol. 43, p. 249)

Lord Charles Beresford in his *Memoirs* states that H.M.S. *Marlborough*, a 4000-ton three-decker launched in 1835 was one of the first ships to be filled with wire lower rigging.

An old edition of the *Encyclopedia Britannica* states that H.M.S. '*Terrible*' was rigged with wire lower, topmast and royal rigging in 1845.

Admiralty letters of 1840 and 1841 to Chatham and Sheerness Dockyards contain several references to wire rigging, one of 1840 stating that as a result of trials in 1838 it was to be used in new steam vessels.

It would therefore appear that if the date of 1851 for the first use of wire in large merchantmen is correct, the Royal Navy was well ahead.

C. M. BLACKMAN

Some 50 years ago in Cornwall I met an old pensioner petty officer of the Royal Navy. He told me that he went to sea in the Merchant Service in the year 1837, and shortly after joined the Royal Navy as an Able seaman. He was very soon rated a petty officer because of his knowledge of the art of splicing wire rope, *which was then just beginning to be used in Naval ships.*

This old man told me that he had served under Sir Harry Keppel, then a young captain, in some ship on the East Indies station, if I remember rightly.

Keppel was a terror for cracking on, and hated shortening sail if he could help it. Sometimes the officer of the watch would send down an urgent request for permission to reef top sails as it was blowing pretty hard. The captain, a very little man, would then come on deck and leaning his foot on the weather mainbrace would say: 'I don't think there is any strain on that yet, Mr Jones, just keep her going as she is.'

On one occasion however, owing to this cracking on, the ship was laid on her beam-ends and was in imminent danger of foundering. The gunner's mate with great presence of mind seized an axe and cut the main sheet, and the ship slowly righted herself.

After everything had been squared up, and the ship on her course again under easy canvas, the captain called all hands aft. 'I want to know', he said, 'who was the man who cut the main sheet?' There was dead silence, everybody expected that the delinquent would be flogged.

'Come on,' said the captain, 'the man who cut the main sheet saved all our lives, I want to thank him.'

The gunner's mate stepped forward, hat in hand. 'I did it, Sir.'

'You go and pass for Warrant Officer and I'll see that you are made a Gunner', said the captain.

This same old man told me that he was captain of the maintop—in I forget what ship—when the Earl of Clanwilliam, afterwards Commander-in-Chief at Portsmouth, was midshipman of the top.

A. MACDERMOTT

QUERIES

1. (1958.) Central Pacific Islands. I am engaged in compiling a History of the Discovery of the Central Pacific Islands and have succeeded in tracking down records covering the discovery of all islands with the exception of those made by the following vessels:

Ship	Captain	Islands discovered	Date	Name given by discoverer
Gilbert Islands				
(1) *John Palmer*	Clerk	Beru and Onotoa	1826	Maria and Eliza
Ellice Islands				
(2) *Rebecca*	De Peyster	Funafuti and Nuku fetau	1819	Ellice's and De Peyster's groups

Ship	Captain	Islands discovered	Date	Name given by discoverer
Line Islands				
(3) *Eliza Francis*	Browne	Jarvis	1821	Jarvis or Jervis
Phoenix Islands				
(4) *Arthur*	Barber	McKean	1794	Arthur
(5) *Transit*	James J. Coffin	Enderbury	1823	Enderbury
(6) *Sidney*	Emmett	Sydney and Birnie	1823	Sidney and Birnie
(7) (?)	Kemin	Gardner	1824	(?)
(8) *Mary*	(?)	Canton	(?)	Mary or Mary Balcout

Any information, or references to information, about these ships, their Captains or the discoveries would be greatly appreciated (and any expenses, fees, etc., involved in obtaining the information will be gladly defrayed). In particular, I am anxious to ascertain the reference to the first announcement of each discovery (e.g. in the *Naval Chronicle*, or similar work).

In addition, any leads at all on the discovery of Phoenix and Hull Islands, in the Phoenix Group, and of Flint Island, in the Southern Line Group (*c.* 1801), would be valued, as prolonged search has revealed nothing.

H. E. MAUDE

2. (1958.) Origin of names. I am very grateful to those who went to some trouble to answer my query (9/1957) about the origin of the names Newarp, Dowsing, Galloper, etc. May I express the hope that *Mariner's Mirror* will in due course publish and tabulate the origins of all such names of sandbanks, etc., around the coasts of these islands, not a few of which seem to provide clues to a clearer knowledge of past maritime history? Why, for example, is there a bank on the south shore of Liverpool Bay called Dutchmen's Bank? This is of course only one example of many.

J. DE C. ISLAND

3. (1958.) Mayflower II. In many published photographs of *Mayflower II* under sail, the Lateen mizzen appears to be set outside the mizzen shrouds: but in a painting by a well-known marine artist the sail is shewn set inside the shrouds. Can anyone enlighten us as to the usual practice?

A. MACDERMOTT

4. (1958.) Captain William Wilson. I am very interested in trying to obtain the fullest possible particulars about Captain William Wilson of the *Emilie St Pierre* who recaptured his ship from an American prize crew and brought her into Liverpool on 21 April 1862. According to my information he was presented with a gold chronometer, a tea and coffee service, and the Mercantile Marine Service Association gave him a gold medal.

I remember reading about this before the first World War when I was a small boy, and it left a very strong impression on me. It was certainly a most amazing accomplishment and, as he was a merchant seaman and we are a place entirely devoted to the training of merchant seamen, I would like to do something to commemorate this very wonderful feat which, at the same time, did not involve any death or harm to the people concerned.

The purpose of this letter is to enquire whether you have got any details, particulars and/or photographs relating to this incident. Furthermore, is anything known as to the whereabouts of Captain Wilson's descendants (if any) and what became of the various items with which he was presented?

G. W. WAKEFORD

5. (1958.) Salvage operations on wreck. From America I have had a request to assist in research about salvage operations on a ship of the Spanish Plate Fleet lost off the Silver Shoals after sailing from Puenta Plata, Hispaniola, in 1642.

In 1686 a Mr William Phipps sailed from London in the *Henry of London* with another ship the *James and Mary*. It is believed he sailed under the charter of the Duke of Albemarle having sailed two years before on the same quest under Charles II without success.

This second attempt had some success. Phipps returned to England late in 1686 with considerable treasure. He died the next year aged 42. I have been asked where corroboration of this story might be found and in particular if the logs of the ships could be inspected for details of courses taken, weather encountered and position of the wreck.

Can any reader suggest sources of information. HUGH B. WILLIAMSON

ANSWERS

3. (1929.) CUTTER BRIGS. It is interesting to find Sir Alan Moore able to quote a letter written by Laughton in 1919 (*M.M.*, 1957, p. 250) as an answer to a query asked in 1929 and left unanswered for nearly 30 years. Laughton then thought it unlikely that any of the cutter brigs were clinker built, but he was writing many years before the appearance of a model which shows that one at least (and probably others from the same district) was so constructed. The model is that of the *Swallow* 14 of 1779, catalogued on p. 38 of the National Maritime Museum's *Catalogue of Ship-Models*, the identification is certain and the model is definitely that of a 2-masted clinker-built vessel.

Bobrik's *Algemeines Nautisches Wörterbuch* of 1850 defines a 'Briggkutter' as 'a vessel built like a cutter, but having a rig like a brig's' and gives 'brig cutter' or something similar as the name for the type in all the Northern languages.

The Russians bought two so-called cutters from England in 1788, but when the Swedes came in contact with them, they described them as brigs. Two years later three 20-gun Russian 'cutters' are actually listed as having two masts. R. C. ANDERSON

Mr Lyman, in his note in the November 1956 *M.M.*, is in error when he says that both Steel and Fincham say that a cutter brig had a cutter's hull and a brig's rig. Both simply say that they were 'cutter-built brigs', and I doubt if the coincidence in phraseology was accidental. Whatever may have been the meaning these writers attributed to the term cutter-built, if one reproduces the lines of a cutter brig from the data contained in Steel's *devis* of such, it will be seen that it is not that Mr Lyman assigns it, as the vessel neither in size, nor model nor appearance resembles a contemporary cutter.

Also from this same vessel it is evident that it was at least not necessary for a vessel to be of extraordinary depth to be a cutter brig, contrary to the statement of Mr Carr Laughton quoted by Sir Alan Moore in the Aug. 1957 *M.M.* Also, since Steel's vessel, like those cited by Mr Carr Laughton, was of 399 tons and as cutter briggs were not very common, it is probable that they were the same vessel. In this case there is a disagreement between Steel and Carr Laughton's informant, as Steel gives her draft as 14 ft. 10 in. and 10 ft. 2 in. *not* 17 ft. 4 in. and 13 ft. 4 in. The further statement of Carr Laughton that cutter brigs were so-called due to their wedge-shaped model appears to me to be unconvincing as *all* clipper brigs had such a model but few were called cutter brigs. Presumably the expression cutter-built denoted some feature of the hull that was or had been general in cutters, but which constituted a distinction when found in a brig.

Those desirous of rigging eighteenth- or early nineteenth-century cutters as brigs evidently fail to perceive that their extreme breadth–length ratio made them a singularly inappropriate vessel for the purpose. Had the length of their masts been made the ordinary proportion of the vessels length, the sail spread would have been small compared to the displacement and the spread of the rigging would have interfered with bracing the yards sharp; had it been made the usual proportion of the breadth, the sails being so narrow would have been extremely difficult to furl and would not have set well on the wind, and at least the stays would have ill supported the masts.

In the Dutch navy barque-rigged vessels were still called brigs, but since cutter-built must apply to the hull, evidently Steel's and Fincham's meaning was not the same as Admiral Smyth's.

D. L. DENNIS

17. (1950.) PHOENICIAN SHIP. In a book entitled *The Seven Wonders of Southern Africa* by Hedley A. Chilvers, published under the authority of the State of South African Railways and Harbour Administrations in 1924, there is on pp. 320–1 a very interesting account of the discovery in 1896 of a Phoenician galley in those parts.

A new cemetery was being laid out at Maitland, outside the (then) city boundary, being formed out of the Woltemade Flats, and corporation workmen were removing old roots of trees, rocks embedded several feet down in the soil and other impediments to grave-digging. At a depth of 6 ft. and $3\frac{1}{2}$ miles from the present coastline an ancient galley was found, lying on one side and measuring 180 ft. long. Of course all the deck-house, oars, mast, etc., had long since withered away.

A further discovery in 1901–2 was made in a river cliff by a monk belonging to the Trappist monastery of Marianhill outside Durban. It was at the junction of the two Natal rivers Ngolosi and Kei. Brother Otto found a series of Bushmen's paintings showing figures garbed in Phoenician and Chinese clothes as well as ancient craft quite unlike anything that would have been found in those waters then or for centuries later.

GEORGE PERCIVAL-KAYE

The alleged discovery of a Phoenician ship near Cape Town was fully investigated by H. F. Sampson in the *South African Archaeological Bulletin*, Vol. III, no. 10, June 1948, pp. 34–40. This is to be found in the libraries of London and Glasgow Universities and others. In brief about 1820 something which appeared to be wood with inclusions of corroded metal was found on the Cape Flats and as someone thought it might be cedar it was identified as the wreck of a Phoenician ship, left high and dry by a rise of the land. In 1852 the Surveyor-General of the Colony described the site as the Tigerberg, 10 miles from the sea and 100 ft. above sea-level. He believed it to be a ship 70 ft. in length, though he had at first thought it might be lignite with inclusions of iron pyrites as described by Sir John Barrow in 1806. The Lieutenant-Governor granted him £20 for excavation but there is no record of his findings. In 1857 A. G. Bain, the geologist, declared it was a seam of lignite and made fun of the theory of a Phoenician ship, which he said must from its remains have been at least a mile in length. Later reports dealt with a similar discovery about 1880, only 3 miles inland at Maitland of the supposed remains of a ship of 180 ft. length. Lignite is found at many places under the sand of the Cape Flats (Geology of Cape Colony).

E. M. P. EVANS

1. (1957.) PREVENTER BRACES. Steel's *Rigging*, 1794 edition, Vol. I, p. 188, article Prevent Brace Pendents answers Dr Anderson's question (*M.M.*, Aug. 1957) about what happened to the end of the preventer pendant—one end went over the yard-arm with an eye, the other spliced into the strop of the brace block.

One wonders what could have been the purpose of Dr Anderson's types A and B, as they would have been perfectly calculated to defeat the object of having the preventer pendant slack—that both pendants might not be cut by the same shot. Type C seems to have been standard in the French navy from 1750 (perhaps earlier for aught I know) until the end of the sail period, as they are frequently found in pictures including many of Baugean's engravings.

In case it may interest Mr Blackman: the 'preventer main brace' mentioned by Nares had become a normal feature in all navies soon after 1815—it is mentioned by French, American and Dutch writers.

Luce, *Seamanship*, 1864, says the preventer brace blocks (that is those of the *real* preventers) had a hook in the end of their pendants; the hook was passed around the yard-arm and hooked around the pendant. He says they led aft for bad weather, forward for combat, but does not say on what yards.

Nares also says that the yard tackles were used for bad weather preventers on the fore- and main-yards and should be led down rather than aft—evidently their purpose was to resist the vertical component of the topsail sheet when the course was not set or the tack was not boarded. This agrees with Lescallier (1791), who says the preventer fore-brace led to the gangway before the main shrouds.

All French eighteenth-century rigging lists I know give preventer braces to the fore and main lower and topsail yards. They were single and writers such as Lescallier and Willaumez say they went over the yard arm with an eye, but since the studdingsail boom and the flemish horse would have opposed this, I suspect they mean there was an eye in the end of the brace through which the other end was rove forming a running eye similar to that described by Luce. Lescallier says they all lead off, but Williaumez says some ships had two to each yard (he must mean yard-arm) in which case I presume one led aft and the other forward. He also says that in double braces a mouse was raised between the standing end and the yard block at such a distance from the former that that on the lee brace would come close to the latter when the yard was sharp up.

D. L. DENNIS

ACTIVITIES OF OTHER SOCIETIES

NORFOLK MARITIME HISTORY—EXHIBITION IN NORWICH CASTLE MUSEUM

6 JULY TO 29 SEPTEMBER

The Exhibition, organized by the Norfolk Nautical Research Society with the support of the Lord Mayor and the Norwich Museum Committee, gave us all a comprehensive review of the maritime life of the Norfolk and Suffolk coast from Roman times to the present, enabled the Society to make a record of objects of historical interest, many of which could not be accommodated in this exhibition, and may perhaps lead to the establishment of a permanent collection. And in one case at least, papers of historical interest have been brought to our notice.

The little collection of marine paintings, all but three in local hands, illustrated the art from Backhuysen to Lowry, particularly Dutch influence on the Norwich school. There was a striking Van de Velde of a three-decker in trouble in heavy weather, probably the *Charles* on the morning after Sole Bay. Models, pictures, photographs and other exhibits, nearly all in local hands, showed the history of the Fishing industry, the shipping and the trade of Yarmouth, King's Lynn and Norwich, and in the Topography section, the changes in the sands and harbours. The part of the Royal Navy section which attracted most attention was the models of the Nine Vanguards lent by the Director of Naval Recruiting. It also included pictures of the battles connected with East Anglia, and portraits of many of its famous sea officers—Myngs, Narbrough, Shovell, St Vincent, Cornwallis, Nelson, Andrew Snape Hammond, Broke, Hoste, Marryat and Sir Harry Keppel. We could trace no portrait of Sir Arthur Knyvet Wilson. The Life-saving section included Captain Manby and his rocket apparatus, a fine model of the Beeching Lifeboat, and Henry Blogg's certificates and medals. Other exhibits illustrated the work of Trinity House, the sailing clubs—that nursery of seamen, shipbuilding and rigging, including electrical gear made by a Norwich firm for the *Queen Elizabeth* and *Skyros Niarchos*, navigation and signalling, and the Custom House. An unusual exhibit was a compass board and models, once used in Admiralty Court of Great Yarmouth. Finally there was a section devoted to the Arts of the Sailor—ships in bottles, bone models, wool pictures, paintings, fancy rope-work and scrimshaw work.

It was Mr John F. C. Mills, our Hon. Secretary, who called the hands and turned them to. The permanent collection we should like to see would enable us to say: 'Si monumentum requiris, circumspice.' But the true and durable monument would be the encouragement given to the rising generation to follow in the steps of their forefathers and give England what she needs, however weapons change—her seamen.

A. H. TAYLOR

THE MARITIME INSTITUTE OF IRELAND

The Maritime Institute of Ireland, among other activities, is engaged in collecting material and finding premises for an Irish National Maritime Museum. Recent acquisitions include the original builders' model of the famous Aran Island packet S.S. 'Dun Aengus', which will be withdrawn from service early in 1958. The core of the collection so far consists of a variety of pictures, documents, models and other material bequeathed in two lots by the family of the late Robert Halpin, mate and later master of the *Great Eastern*, a native of Wicklow.

The Halpin Bequest 'Great Eastern' Collection consists of:

A. (1) Model *Great Eastern* housed in glass case on cupboard stand in dimensions about 8 ft. long by 6 ft. high and 2 ft. 6 in. in depth.

(2) Log books of *Great Eastern*.

(3) Case containing sections of all cables laid by Captain Halpin.

(4) Twenty-six coloured prints with framed index illustrating scenes on board the *Great Eastern* during laying of cable. (Size about 8 in. × 6 in. each.)

(5) Presentation portrait in oils of Captain Halpin. (Size about 6 ft. × 4 ft.)

(6) Newspaper cuttings, photographs, letters and other documents referring to Captain Halpin's period of service in the *Great Eastern*.

B. The next most important collection comprises thirty or forty coloured paintings of nineteenth-century vessels measuring about 2 ft. 6 in. × 2 ft. Twenty-four of these are by the artist Thomas Dutton.

C. A miscellaneous section, including Captain Halpin's ceremonial uniform, cocked hat and ceremonial sword all carefully packed and preserved in their original containers.

The captain's sea chest (in teak measuring about 4 ft. × 2 ft. × 2 ft.) bearing his name plate and containing in the lid an inlaid representation of the *Great Eastern*; sundry presentation diplomas framed from various bodies and persons (Liverpool Chamber of Commerce, Dom Pedro Segundo, Emperor of Brazil, etc.); a chart (framed) of the Atlantic cable (Valentia to Newfoundland). A framed sectional plan of the *Great Eastern*. Captain Halpin's chronometer, telescope and other nautical instruments.

D. A miscellaneous collection of paintings, drawings, photographs and sundry other material of marine interest. Most of the paintings are of nineteenth-century sail steamships; also pilot boats in the Mersey, Thames barges, incidents at sea and a variety of *Great Eastern* pictures in various places, including photographs just before breaking up, and a poster, with details, announcing her forthcoming sale, dated 1888.

J. E. DE COURCY IRELAND

THE AMATEUR YACHT RESEARCH SOCIETY

Studies of 'Sail evolution' and outrigger development are to be found in two publications of the Amateur Yacht Research Society. The method employed in these studies is to arrange all known types of sails and outriggers in sequences of constructional similarity from one type to another.

The study of 'Sail Evolution' attempts to show that the most primitive sail was made from two palm leaves matted together either in the form of a rectangle, giving a Nuggar-like sail or in the form of a triangle, giving the Oceanic Lateen. From these primitive sails all others could, it is claimed, have been derived by simple modifications.

In the study of 'Outrigger Development', it is the author's opinion that the basic principle was developed by the Melanesians from the degeneration of a raft placed on top of a solid log. This concept is a different approach from that of Hornell. The Melanesians developed their own special version of the idea while the Polynesians and Indonesians adopted the later Melanesian float and outrigger beams on to their previously developed dugout canoe.

These two publications will be found of great interest to students of the Pacific cultures. They are available from the Hon. Editor, A.Y.R.S., 123 Cheriton Road, Folkestone, price 2*s.* 6*d.* each.

JOHN MORWOOD

REVIEWS

A Portrait of Lord Nelson. By Oliver Warner. Chatto and Windus. $8\frac{1}{2} \times 5\frac{1}{2}$ *inches*. 384 *pages*; *appendix*; *plates*; *maps*. 30*s*. net.

Mr Warner's is the first of the many tributes to Lord Nelson which we may expect during a year which marks the bicentenary of his birth. His book sets a high standard. It can be recommended as a vivid, reliable and comprehensive biography, not only for the general reader, but for those members of the S.N.R. who may be expected to know their Nicolas backwards. Everyone will find something unfamiliar in it—that the gates of Valetta cathedral were in the hold of *L'Orient*, for example, or that Nelson was a bad shot. Mr Warner is wise enough not to exaggerate the importance of any new material he has added to the vast amount which is already available, but he has discovered yet another love affair at Leghorn in 1794 and also Nelson's notes on the Baltic campaign. A more probable alternative to the story of Lady Nelson's last words on the subject of Emma—'I am sick of hearing of dear Lady Hamilton'—is provided from Farington's diary, which concludes with the obvious truth that 'their tempers were not calculated to suit each other'.

How does this biography compare with others? It is not as magisterial as Mahan's, though fuller on the domestic side. It is not as monumental as Miss Oman's, because there is far less trivial detail. It is not as well written as Clenell Wilkinson's, but it is based on a much wider knowledge of the sources. As the compiler of a useful bibliography of Nelsoniana, Mr Warner's scholarship is impeccable, and one is grateful to him for quoting most of the famous episodes in the original. Convinced that the duty of a biographer is 'to rediscover not perfection but the extent of the man's genius', he holds a proper balance between Nelson's public and private life. The damning reports on what Nelson himself called 'my consummate vanity' are printed alongside the memorable tributes to the love which he inspired. Though he skilfully disentangles the threads of the Caracciolo affair, Mr Warner does not exonerate Nelson entirely and (what is more unusual) he is fair to Lord Keith.

If anything, this is too objective a portrait because the subject is treated from the outside rather than the inside. When the author stands aside from the narrative to delineate the minor characters, the result is excellent; but the complexity of Nelson's character, its disparate elements of vanity and humility, priggishness and fearlessness, pettiness and greatness, are illustrated rather than analysed. One of the troubles about Nelson as a subject is that his *obiter dicta* are so eminently quotable that a biographer is apt to leave it at that. But what often appears to us as nauseating gush can, for example, be understood when seen against the background of a highly emotional, romantic age in which the impact of the news of the Nile was such that the First Lord fell flat on the floor, both the Hamiltons fainted and even George III stopped talking for a few moments. What Mr Warner has successfully done is to follow Southey's advice that 'the best eulogy of Nelson is the faithful history of his actions'.

The book is called a 'portrait', and it is on the iconographical side that Mr Warner is strongest. There is a full list of Nelson portraits in the appendix, though the most recent discovery (which Mr Warner himself describes in the *Naval Review* is omitted, presumably because it is not authenticated. Personally, I do not share the author's admiration for the Schmidt portrait, and the travesty of it on the jacket seems to me a pity. However, the only serious criticism of the book which can be made is the way the references are printed at the beginning and not at the end. Even then it is uncommonly difficult to run a quotation to earth because only sectional references are given. We all know how notes and numbers are discouraged nowadays, but in a scholarly book like this an author should not be bullied by his publisher in the interests of what is certainly an elegantly produced book.

CHRISTOPHER LLOYD

THE WAR IN THE MEDITERRANEAN 1803–1810. By PIERS MACKESY. Longmans. $8\frac{3}{4} \times 5\frac{1}{2}$ *inches*. 430 *pages*; *maps*. Price 45*s*. net.

THE PRIVATE CORRESPONDENCE OF ADMIRAL LORD COLLINGWOOD. Edited by Edward Hughes. 9×6 *inches*. 348 *pages*; *plates*. Navy Records Society. Price to non-members 45*s*.

'The service is become very arduous', wrote Collingwood to his wife from sea. 'I cannot tell you about it in a letter; but some long winter's evening I will give you the whole history.' Alas, Collingwood did not live to enjoy the reminiscent pleasure which he deserved so much. 'I have not let go an anchor for fifteen months', he wrote on another occasion; in fact, he wore himself out in the exercise of sea power, far from the home he loved, faced continually with what Mr Mackesy so well calls 'the intricate squalors of European politics'.

Those who remember the extracts from Mr Mackesy's book which appeared in this *Journal*, dealing mainly with the sparring between Collingwood and Ganteaume, will know that his is a scholarly and fully documented work, long though never dull. It is indeed a tale fit for some winter's evening', and it is a new one, for the strategy employed against Napoleon in the Mediterranean has never before been covered in detail. In a way, it is a disappointing subject. Neither Nelson nor Collingwood, his friend and successor in command, had the stimulus of area decision against the fleet they watched so tirelessly over so many years. The Nile and Trafalgar were both fought out far from Toulon, which was the object of their protracted attention, and always the danger spot.

The story in the seven-year span of this survey is one of move and counter move; schemes contrived and frustrated; caution; intrigue; partisan operations; with personalities coming and going, and only one little success ashore, at Maida, to cheer authority at home. For although a strategic reserve was maintained in Sicily, little was effected with it, and it was not until a military genius lodged and employed an army in the Iberian Peninsula that there grew an active ulcer which, as he himself confessed, sapped and drained the massive land power of Napoleon.

Yet in spite of frustrations, something was accomplished. The classical combination of sea power, re-described by the author as 'an interwoven complex of warships, garrisoned bases, and a disposal force of troops with transports', was as effective as ever in containing greater numbers of the enemy. By the year 1810, Napoleon had 3600 cannon, in 900 coastal batteries, scattered along the European littoral. They were manned by 13,000 gunners, and the Emperor was always wanting more. That, together with a disheartened navy and disrupted trade, was the cost to the enemy of British pressure in the Mediterranean.

If there is a hero in this book, it is Collingwood, though his limitations are not overlooked. He was a man who grew with responsibility. At the opposite pole there is Sir Sidney Smith, Nelson's *bête noir*, who had the effrontery to write of Napoleon, 'I will dare to do more than he will dare to imagine'; and there are generals and diplomats who range from the tolerable to the indifferent. But one of the book's consistent virtues is that people and events are never seen in terms of unrelieved black and white. Mr Mackesy is always generous in his appreciation of the difficulties, not only of the commanders on the spot, but even of the politicians at home, who had such difficulty in controlling strategy from so great a distance, with communications so erratic.

Professor Hughes's timely edition of Lord Collingwood's letters is most welcome, for Collingwood was one of the clearest and best writers the navy has ever produced.

OLIVER WARNER

HOW THE MERRIMAC WON. By R. W. DALY. New York: Crowell Co. $8\frac{1}{2} \times 5$ *inches*. 211 *pages*; 5 *maps*. Price $4.00.

To judge from the five-page bibliography at the end of this book, the literature on the duel between the *Monitor* and the *Merrimac* bids fair to rival that on Trafalgar, in which case it is

justified on the assumption that this was the critical naval event in the American Civil War. What happened at Hampton Roads in March 1862 is well established. The question is, who won and what influence did it have on the course of the war? The familiar story is that the timely arrival of Ericsson's *Monitor* defeated the *Merrimac* (re-named *Virginia* when the Confederates reconstructed her as a casemated ship), thereby preserving the Northern blockade. The highly original argument advanced in this book by Professor Daly, of the U.S. Naval Academy, is that, since she was never intended to be an ocean-going ship, the *Merrimac* was never really concerned with the blockade. Built as a floating fortress for harbour defence, she exercised more influence on the war before and after her brief excursion into Hampton Roads than during the action itself. It so happened that General McClellan was the one man who could appreciate her strength because, shortly after the Crimean War, he had visited Europe to examine the potentialities of the new experimental ironclads. When, therefore, he planned to win the war at a blow by the capture of the Confederate capital by an amphibious advance up the James River, it was the news of the building of the *Merrimac* at Norfolk which checked him. Thus a frigate which had ended her service on the high seas now, in a new guise, frustrated Northern plans by the mere fact of her existence.

From this summary of a cogently argued and well-documented book it will be seen that the author is primarily concerned with strategic issues. Details of build and tactics are not neglected but where both sides claimed the victory in their 4-hour slogging match (in which the ships actually touched each other five times), it is the broad conclusion which counts: 'If she did not decisively defeat the *Monitor* in battle, she won a greater victory: she defeated Lincoln and his government in their hopes of winning a short war.'

The only flaw in an otherwise admirable little book is a loosely worded digression contrasting British and American strategic traditions, in which several curious misconceptions are displayed, it is needless to say to whose detriment.

CHRISTOPHER LLOYD

Flags of all Nations. Compiled by H. Gresham Carr, F.R.G.S. Glasgow: Brown & Son and Ferguson, Ltd. 1957. Sheet, 33 × 20 *inches*. 357 *designs*. Price 7*s*. 6*d*. net.

The Society has again to be proud of the work of one of its members, for here is another splendid production by Mr H. G. Carr, 'the leading authority with an international reputation'. Although there was an edition in 1952, this publication has not been noticed in the *Journal* since Mr Cecil King reviewed it in October 1934. Incidentally the 1952 issue demonstrated the speed of Mr Carr's work, for it is dated February of that year and contains the banner of the Queen Mother, although the Queen's Accession was only in that same month! The price may be considered high for a sheet of flags, but one must take into account the cost of printing in several colours and the superior standard of accuracy and clarity provided. I do not quite know what the advantage of a *sheet* of flags can be, as opposed to a booklet; it is certainly difficult to manage unless spread out. It is too valuable to be stuck up with drawing-pins, and it is rather large to have framed and glazed, though that is the obvious treatment for an office or school. The flag-sheets of the early nineteenth century were generally additionally bound as little books, but they had to be arranged specially to be cut up in that way. The cover of this newest issue is a tremendous improvement on the amorphous conglomerate design that went before, and now comprises a neat array of various national flags containing red, white and blue. The only comment that I can offer is that the colours of the French ensign should surely be in the proportion of 30:33:37 instead of being equal. Some of our members may be surprised to observe that the Geraldine red saltire on white is apparently recognized officially as the Jersey island emblem, and that the Commissioners of Irish Lights still use an ensign containing the British Union Jack. Among the new features there is the amusing house-flag of the Mersey Docks and Harbour Board. The British Pilot Jack is depicted as being the orthodox shape of two to one, but in practice I doubt very much whether these proportions are ever actually seen or adhered to on the Seven Seas.

H. P. MEAD

So Noble a Captain. The Life and Times of Ferdinand Magellan. By Charles McKew Parr. Thos. Y. Crowell and Co. 1955. 10 × 6 *inches*. 423 *pages*. Price $6.

This new life of Magellan has been written by an American business man and spare-time farmer who has been a life-long admirer of the great circumnavigator. Stung by what seemed to him an historian's injustice to his hero, he has devoted many years to the collection of books and records which would show Magellan great in life as well as in discovery. But, say his publishers (thus breezily and in a phrase dismissing the academic world), Mr Parr 'is no recluse in a library', so there is no need to review his book as a work of professional scholarship. It is frankly partisan, a spirited and fascinating reconstruction of a man's life spent during what was perhaps the most exciting and colourful period of our epoch—the Great Age of Discovery. Where documents are lacking the author has not hesitated to use his imagination, and he has his business experience, too, to guide him. The financiers and brokers, equally with the sailors, bishops and kings are given their due part in the story. A whole chapter, for example, is devoted to Cristóbal de Haro and another to Jakob Fugger, although in the latter it is a little disconcerting to be told that spices bought for a ducat and sold for a hundred ducats meant a profit of 10,000 per cent.

The young Magellan is pictured for us at first as 'employed in a clerical capacity in the maritime division of the Mina House' whence he is sent down daily to the nautical shops, the ships' chandlers, and the Italian and German warehouses to purchase supplies. It may well have been so, just as it may well have been true that Geoffrey Chaucer had been the 'dearest teacher' of the girl who became Queen Philippa of Portugal. The professional historian would certainly admit some connexion between the poet and the household of the lady's father, John of Gaunt, and since Chaucer was also an astronomer, and knowledgeable about matters of seamanship it is tempting to speculate that through the Queen he had some indirect part in the career of her son, Prince Henry the Navigator.

Magellan transferred his allegiance from Portugal to Spain, and we are shown a vicious and spiteful King Manuel publicly humiliating a loyal subject who was begging for some employment in his service. Stunned and confused at his rejection the now experienced sailor sits night after night in the tap-room of the tavern 'feeling a man apart'. So he goes to Spain. In the story of the Pacific voyage itself, always worth retelling, Mr Parr follows, of course, the narrative of Pigafetta, and it was from a Spanish version of this relation that he chose the phrase that forms his title—'So Noble a Captain'. He possesses, however, Ramusio's *Viaggi* (which includes Pigafetta) in his own library, and it is the long list of relevant books in this library that is printed as a Bibliography, although much other material was used. This is clear from the incidental quotations from contemporary documents and letters upon which his judgments have been based. The book has a number of useful factual Appendices, one of which concerns the personnel of the great Spanish ship of Magellan's day. This contains a reminder that the captain of such a ship or the general of a fleet was not necessarily, or even usually, a navigator. To remember this would save a great deal of argument and falsification about Columbus. Mr Parr, however, places the Master second in rank and above the Pilot, while Hakluyt (using Spanish information) reverses this order, and this is consistent with the fact that Spanish pilots had to undergo a very rigorous training. In England, on the other hand, the Master took precedence as a general rule.

Sailors must not mind that Mr Parr terms a west wind 'easterly', nor geographers that he finds the frigid zone so far outside the Antarctic Circle. This is a most readable and delightful book, although the wonder is that writing it did not occupy more than the ten years acknowledged. For it had to be fitted in between directing Electrical Companies, rearing prize sheep and poultry, and engaging in public service in the Legislature of Connecticut.

E. G. R. TAYLOR

Forum Navale, No. 13. Uppsala, 1955. Två Svenskar under Union Jack. The Swedish Pioneer, No. 3. Rock Island, Ill., 1956. Two Swedes under the Union Jack. Price not stated.

The first of these two 40-page pamphlets is published by the Sjöhistoriska Samfund, the second by the Swedish Pioneer Historical Society of Chicago as a translation of the first, a Journal kept by two Swedish officers serving in H.M.S. *Phoenix* on the American station in 1775–6, mainly in the neighbourhood of New York.

This is an interesting record of small-scale operations and of how details of life in a British man-of-war appeared to foreigners, but unfortunately the translation suffers from the same fault as that mentioned in the review of *The Viking Ships* in August 1955, that of being the work of a translator working the wrong way, from his own language into another. Usually no great harm is done, but there are occasional bad mistakes, perhaps due in part to lack of technical knowledge. For instance, on 15 September and 8 October 1776 'archelie port' is translated as 'ammunition gate' when what is meant is 'gunroom port'. A reference to Röding's polyglot dictionary would have prevented this. On 12 July there is a description of a method of repairing a parted shroud by means of two deadeyes with sennit tails and a laniard between them. This has been spoilt in translation by saying that 'each end of the deadeye' was made fast, whereas what was written was that each tail was made fast to one part of the shroud.

Occasionally the translation almost suggests that it has been made from some other original. On 17 August on the approach of a fireship the Swedish version has: 'We cut our cable at once and opened fire, but in a few minutes she was before our bows and just then they set fire to her and rowed away.' In the translation this appears as: 'We cut our anchor cables and began firing, but in 10 minutes she boarded us on the starboard bow, at which time the rebels set fire to her and left her.'

The first day's entry (4 August 1775) remarks on 'a new method of letting the tiller-ropes run on sheaves, covered in'. This is translated as 'a new method of allowing the wheel or rudder blocks to be manœuvered by means of rollers'. The new method would seem to have been that of running the tiller-ropes along a series of sheaves set in a slot along an arc with its centre at the rudder-head, as can be seen in the *Victory*. Illustrations of this are surprisingly rare; the only one I have been able to find is in a Spanish book of 1791, Ciscár's *Maquinas y Maniobras del uso de á bordo*, plate 6, fig. 48. All the nautical dictionaries show the simpler, but less efficient, lead straight from the ship's side to the tiller.

In his Report on Admiralty Records showing how the *Victory* was fitted at Trafalgar, printed in the *M.M.* in 1910, Laughton mentioned that 'an invention of a Mr Pollard for keeping the tiller-ropes tight had been generally adopted by order of 16 August 1771'. The date is about right and the lead round an arc would have that effect, but it may well be that Pollard's invention was something quite different.

R. C. ANDERSON

CORRECTIONS, VOL. 43

P. 270, *line* 3, *for* Royal Charles *read* Royal Prince.

P. 330 *for* 1795 *read* 1705.

P. 331, *for* 28 July 1753 *read* 28 July 1653.

P. 331, *after line* 40 *for* The Film Sea ships
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